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October, 1987 Covering data, voice and image communications ISSN: 0817-1904

# IBM order paves way for directory charges

MELBOURNE — Telecom has ordered $A11 million dollars worth of IBM hardware and software to upgrade its directory service, and will start charging for enquiries from next July.

According to Telecom, answering directory inquiries costs $A60 million a year now, and was tipped to rise to $A100 million a year in the near future.

Telecom is also modifying its Ericsson automatic call distribution system to accept billing pulses "so we can charge for other products if we wish to," according to Mario Zilko, manager for operator-assisted services.

These could include recorded voice services and other unspecified offerings. Observers believe Telecom is close to agreement with a vendor of voice-messaging systems and will offer a bureau-type voice mail system.

Zilko said the $A11 million contract with IBM was for $A8 million worth of Series One minis to replace S/7 machines installed in 1983. $A3 million is for the application software. He said Telecom had "spent a lot to enlarge the (enquiry) service (and) bought the latest equipment." It believed in the principle of "the user pays" and would therefore start charging for inquiries from July 1988, Zilko said. He would not disclose the planned charges .

Telecom's manager of the public network services business unit, Leo Tyrrell, said it was costing the commission 50-60¢ a call to service the directory inquiries, and Telecom was seeking to recover the associated costs.

He dismissed as "totally wrong" suggestions that Telecom was putting in place the machinery for introducing timed local call billing.

But observers said the equipment being used, including Ericsson's internationally successful locally designed ASDP 162 queueing sytem, could easily serve such a role.

The system even now identifies the origin of a call by its trunk group. Up to 400,000 calls can be handled each day by an ASDP.

# NSW ready to roll with N-net *a la* Vistel

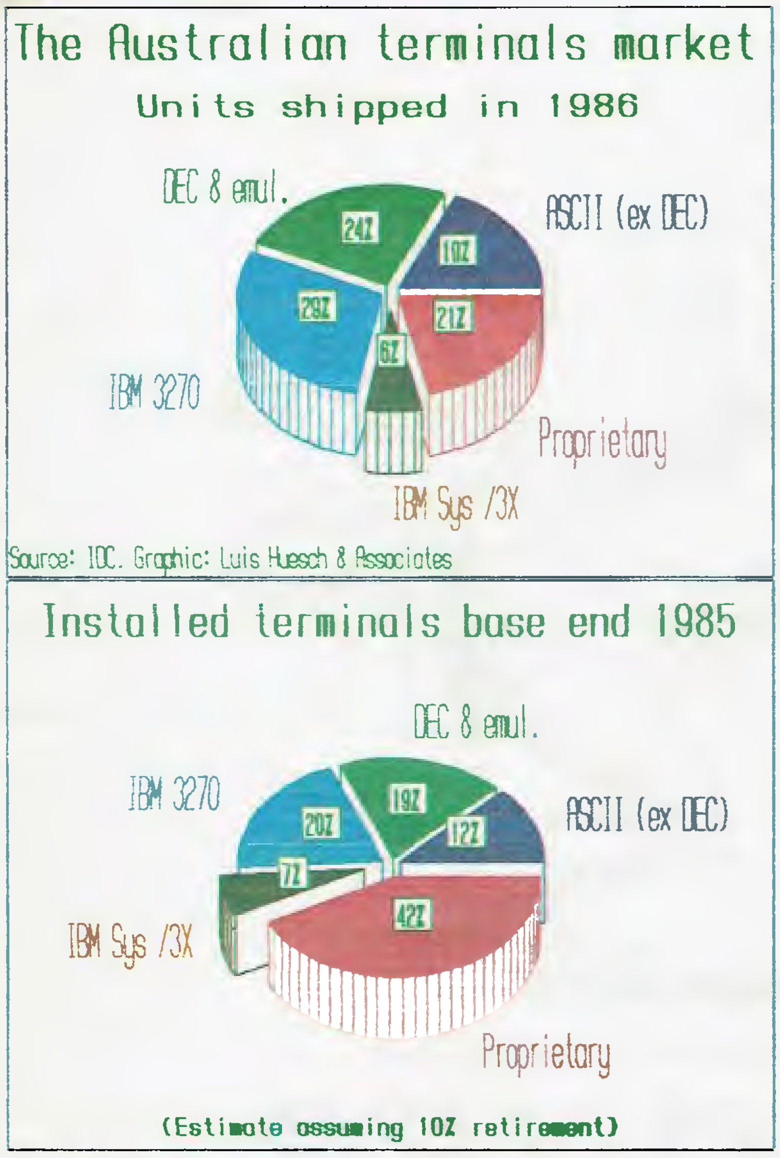
SYDNEY — The NSW government is poised to decide its telecommunications future, based on recommendations from the architects of the Victorian Vistel net headed by Tony Newstead.

Judging from the composition of the task force now reviewing the KNG consultancy group's proposals, it is likely that a similar solution will be used, for representatives of the State Rail Authority have been co-opted. In the Vistel arrangement, Telecom was handed the State's railway easements to construct the fibre-optic backbone network, with an undisclosed capital contribution from the Victorian government.

According to the chief accountant of the NSW Treasury, Bob Scullion, who heads the Computer Funding Priority Committee, the review team consists of Treasury, Premier's Department and Public Service Board officials, together with representatives of the State Rail Authority and the Department for Industrial Development and Decentralisation.

Scullion declined to comment further, apart from saying the review team's recommendations would go before the NSW Cabinet "in the next week or two". The consultants' report was presented to the team in mid-September. Newstead also declined comment.

*(Continued page 3)*



The Australian terminals market

Units shipped in 1986

Source: IDC. Graphic: Luis Huesch & Associates

Installed terminals base end 1985

(Estimate assuming 10% retirement)

# Car plants to run EDI pilot

*By Terry Watson*

## *Telecom wins big five over to Tradelink*

MELBOURNE — Telecom has signed up Australia's big five car makers and their suppliers to jointly develop an electronic document interchange (EDI) network.

An agreement to this effect was signed recently between the Federal Chamber of Automotive Industries (FCAI), the Federation of Automotive Products Manufacturers (FAPM) and Telecom.

Telecom's EDI system, Tradelink, is being designed for direct computer-computer transmission of trading documents such as purchase orders, delivery notes and invoices.

"It will be particularly relevant to the implementation of the Just-in-Time inventory concept which is considered to be a critical element in the Button plan to make Australia's automotive industry more efficient and competitive," said Robert Copley, executive officer of the FCAI.

"It will ultimately involve enormous savings in rationalising the movement of material into the manufacturing plants. I expect to see EDI well integrated as a management tool in the industry within 12 to 18 months."

After an initial test, a pilot operation will involve all the manufacturers, together with a number of component suppliers and transport companies. This pilot operation will take about six months to complete and will help locate any bugs in the system. These are expected to be in user education and training, rather than technological.

Tradelink is an Australian-

*(Continued page 3)*

# AAP acquires MDN Vsat gear

SYDNEY — AAP-Reuters Communications (Comco) has bought the satellite and microwave network equipment and contracts of McConnell Dowell-Nichols (MDN), boosting Comco's small-dish coverage of rural Australia to 59 remote earthstations.

No contract price was disclosed, but it is believed to total around $A1 million.

Announcing the agreement, which also includes the distributorship for the small satellite exchange Sky-Switch, Comco general manager Barney Blundell said addition of the MDN network made AAP the largest operator of rural data and voice satellite earth stations in Australia.

He said the Sky-Switch Dama (demand-assigned multiple access) voice equipment complemented Comco's present range of voice and data satellite equipment sourced from M/A-Com. Observers pointed out that the Dama switch is totally incompatible with Comco's existing TDMA (time division multiple access) satellite gear.

MDN chairman Marshall Hudson said assignment of the satellite networks was in the best interests of existing MDN customers.

**INSIDE**

**Hicom: here I come . . .**
Siemens, Telecom plan PABX launch
— page 4

**Terminals chart**
— page 22

**Q-net: wild guesses continue**
Peter Young looks at Parry's options
— page 5

**CORE REPORT**
On ISDN starts on
— page 10

# Telecom offers research cash

SYDNEY — Telecom has offered what it described as substantial funding to universities willing to established well-focused hotbeds for communications-related research.

The commission's research director, Harry Wragge, told the 21st International Electronics Convention and Exhibition in Sydney recently that Telecom was prepared to put heavy dollars into funding such centres.

Wragge said Australia had "an absolutely disastrously low level of research students in telecommunications", yet it needed research to establish its credentials in the international trade in research. He blamed industry in part for offering "low rewards" to suitably qualified graduates, and slated Australia's overall "singular deficiency in commercialisation management".

Wragge said a $A1.3 million project over three years with Adelaide University's Teletraffic Research Centre was only the first of a planned series of funding moves for universities.

The commission was discussing a similar scheme with Melbourne's Monash University, which is to establish a chair of information engineering.

Telecom was critically dependent on new technology. Its own research laboratories had recently grown a new material which it hoped could give Australia the edge in gallium arsenide technology.

It had in the past collaborated with the universities on an ad hoc basis through the Australian Telecommunications & Electronics Research Board (Aterb), and similar ventures.

But a more focused approach was now needed to foster the emergence of more enduring teams of excellence, for instance in signal processing. "We need these teams as a national asset," Wragge said.

Telecom saw this funding offer as seed money, which should attract further funds from other sources, including industry.

He said under existing arrangements, university research was often stretched too thin, and threads collapsed when a lecturer was wooed away.

Telecom had been forced to cancel a number of research contracts because of this.

# C&W prepares to enter our Vas market

By Tom Amos

SYDNEY — British-based Cable & Wireless Plc intends to enter the Australian marketplace as a provider of value-added services, according to the chief executive of C&W Hong Kong, Greg Crew.

Crew gave no details of any concrete plans by the billion-dollar profit maker, but provided an international insight into the plans C&W has put in place for expansion and for tackling regulatory policies in the region during his keynote lecture to the Telecommunications Society of Australia recently. He was the 4th CEO to speak on the subject of telecommunications regulation within a week.

He saw C&W's role in Australia as that of a Value-Added Service (Vas) provider, not competing with current providers for basic services but providing a service above basic services.

Crew cited the provision of cellular phones in Hong Kong by three competing networks as a successful Vas-type service. He noted that an independent government regulator had set the timed interconnect fee for connection to the local telephone network. All three providers are competing to provide the best coverage and service to the user.

Other potential growth markets such as the provision of facsimile bureau services were of interest to Vas providers, said Crew.

Crew reminded his audience that all telecommunications providers start out as monopolies and move, over time, away from such positions as the host nation develops a sufficient and robust infrastructure to support competitive services.

## "Conflicting pressures"

There were "a number of conflicting pressures building up" in the world telecommunications scene, including in the Pacific Basin, said Crew, who argued that significant cost reductions would be passed on to the user, particularly in the international area, because of competition from nations' emerging multiple carriers.

Crew at the same time supported the use of cross-subsidisation between services and users to produce average costs per connection per region — the antithesis of the competitive enviroment C&W is seeking to establish by its current expansion.

C&W is a public company, listed on the UK stock exchange, and operates a number of telecommunications service providers throughout the world. It has been involved in both competitive and non-competitive environments.

C&W operates British Mercury, competitor to British Telecom, is a joint venturer with the Chinese Ministry for Posts and Telecommunications for provision of services in China and has applied for a common carrier licence in Japan with a Japanese consortium.

The company, with reported profits of $A2500 million, has been the target of a share raid by the Hong Kong-based Li Kashing group of companies. Li, one of the company's competitors in the Hong Kong cellular phone market, indicated he was paying $HK3000 million for an initial stake of five per cent of C&W Plc. He is at present unable to buy more than 15 per cent of the company without permission by the British government and the concurrence of C&W.

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SCL 101

# Car plants to run EDI pilot

*(Continued from page 1)*

developed network involving transmission and mailbox services, file handling software, document translation software, and customer support services. Both dialup and dedicated line communications are allowed via Telecom's Austpac packet-switching network, which has the ability to connect internationally.

Only registered traders may conduct business through the service, which has a number of security features. The mailbox area allows mail to be delivered direct or stored for later retrieval.

File translation software converts user documents into standard Ansi X12 format which is required by the transfer software. The system is menu-driven and includes logging and alarm functions which supervise and advise on document movements.

Although this specific agreement covers only the automotive industry, Telecom believes that after the present implementation is complete, the system will be expanded to include industries such as retail, electronics, chemical, pharmaceutical, import and export.

Colin Hill, Mitsubishi data projects manager and chairman of the industry's EDI committee, said: "Eventually it is likely that EDI will be used by most of Australia's industries on an interlinking basis, and that Australia will form part of a paperless trading global chain. We expect that as Telecom refines its Tradelink system, Australia will be in a position to sell this technology overseas."

Telecom is using a Tandem host processor and incorporating a number of security enhancements. Participating companies initially will be offered software suitable for the IBM PC or IBM MVS environments. Telecom is looking at porting the software across to other systems when required.

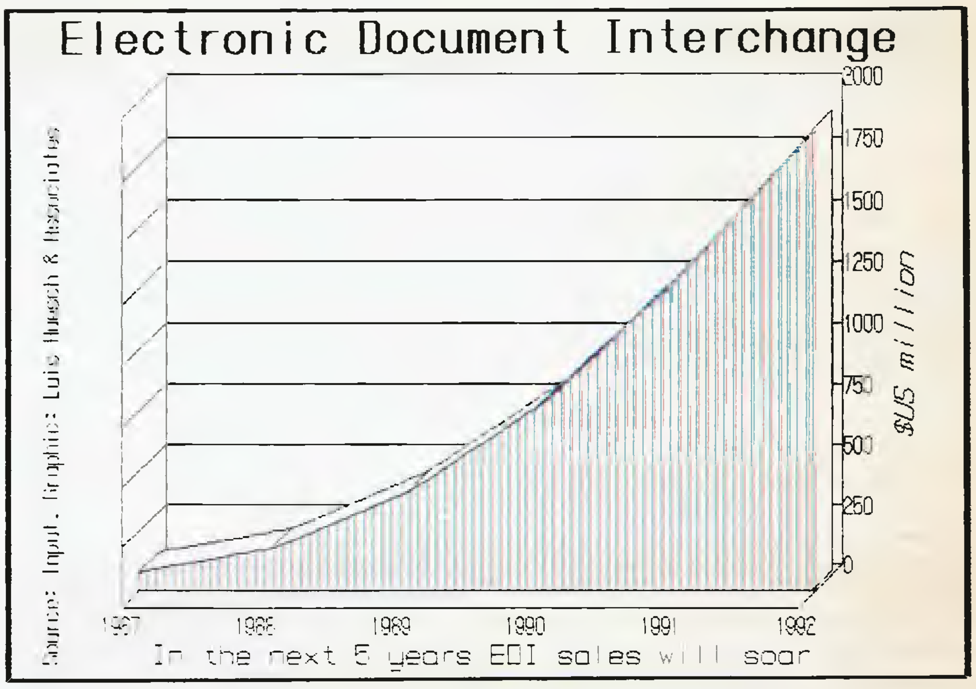
"Commenting on industry claims that Australia was not ready yet for EDI, Copley said "the automotive industry is certainly ready and willing".

"He said in the first phase of testing, starting this month, GM-Holden's would be linked to brake and clutch suppliers to trial both software and procedures.

"After Christmas, others among the five car makers would join in the second phase of the trial, when pricing options would also be determined.

"Copley said Telecom had "already invested lots of money and people" in Tradenet, and the experiences of the automotive industry would be followed with interested by other potential clients, such as Customs. Initial tests had been successful and "we are very happy with our choice", said Copley.

Electronic Document Interchange



Source: Input. Graphic: Luis Huesch & Associates

In the next 5 years EDI sales will soar

# Cabinet checks out N-net plan

*(Continued from page 1)*

In its Telecommunications Development Strategy report published earlier last month, the NSW government pointedly noted communications empire building by individual departments, "conceived and developed separately, with a certain degree of duplication."

It quoted Public Works Department estimates that $A10 million a year could be saved by co-ordinated planning and purchasing processes alone.

The report said that after telephone system funding was "devolved" from Public Works, "Individual departments are taking charge of communications network development...and are establishing dedicated networks which in general make use of leased Telecom links.

"Some of the larger instrumentalities such as Police, State Rail Authority and the Electricity Commission have also built substantial microwave transmission systems and are looking toward satellite augmentation," the report said.

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# Hicom on the way

*By Luis Huesch*

## Siemens poised to launch ISDN switch in Australia

MELBOURNE — Siemens Limited Australia has received Telecom authority to connect its Hicom PABX — a switch claimed to have been designed "from the ground up" for the Integrated Services Digital Network (ISDN) — to the Australian network.

Informed sources said the Melbourne-based company, subsidiary of the West German telecommunications giant Siemens AG, would distribute the switch through Telecom next year. Neither Telecom nor Siemens would comment on the report.

According to Siemens' PABX product manager Ben Braeuer "field trials are proceeding on schedule in various States". Telecom is known to have five Hicom PABXs. It also already uses Siemens' ISDN testing equipment in ISDN trials with other vendors' PABXs.

Braeuer would not disclose details of the trials or the negotiations with Telecom, but said a formal release of the Hicom into the Australian market would be made "in the near future".

He said Siemens had installed more than 1000 Hicoms worldwide in the past two years. The parent company had invested considerable funds and resources in the past five years to ensure its place at the forefront of ISDN technology.

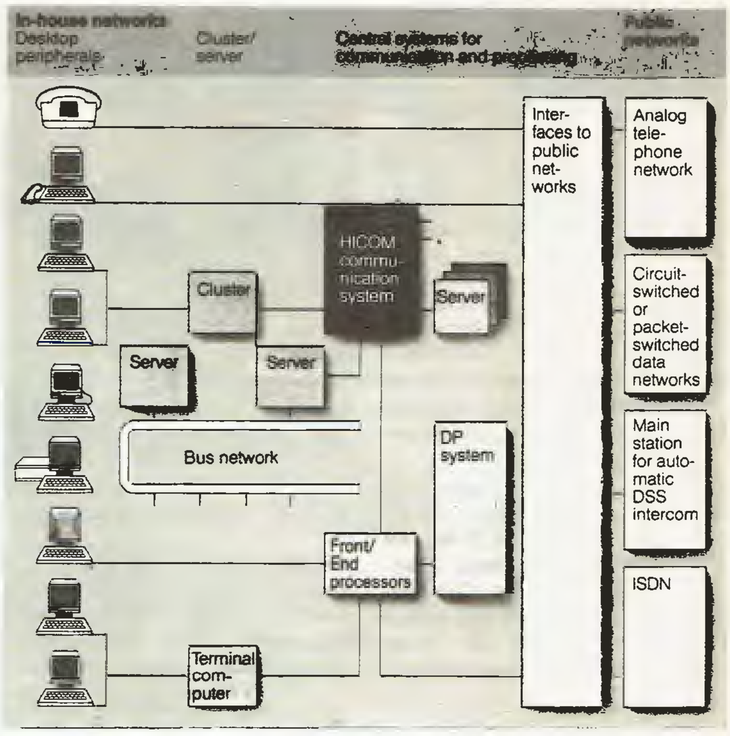
"At Siemens Ltd Aust. we have been building up the necessary technical expertise and administrative infrastructure for a smooth transition into the era of ISDN products and services with increasing intensity over the past 12 months," he said

Braeuer noted that although the Hicom had been "developed from the ground up to provide ISDN features and services with ease", it also could interface to current-generation equipment such as analogue telephones or standard data terminals.

At the same time, Siemens could already offer its first ISDN multifunction terminals, the Hicom 3510 Multiterminal.

According to Braeuer, many suppliers today offer nothing more than "black box" patches to third-generation PABXs.

**Core Report on ISDN begins P10**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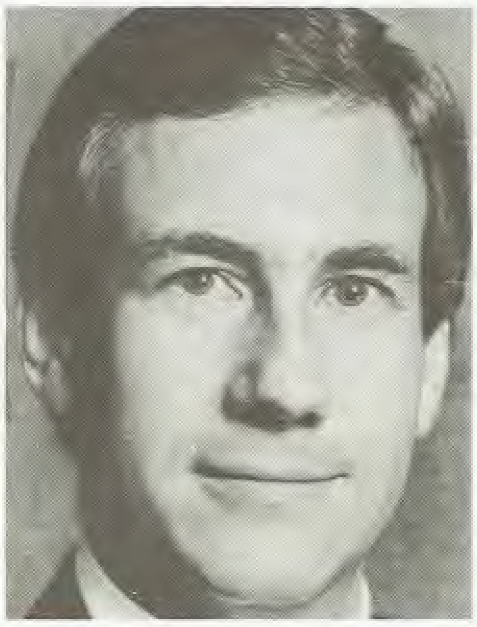
**Terry Winters . . . need to share**


**Thomas Hinton . . . big potential**

# Link Telecommunications swallowed by US giant

*By Terry Watson*

MELBOURNE — Australian paging and telephone answering company Link Telecommunications has been swallowed up by US giant phone company Bellsouth Corporation.

Terry Winters, founder and managing director of Link, said: "While Australia has adopted message paging techniques more rapidly than the rest of the world, we need to establish technology sharing with other countries and must provide global services.

"Telecommunications in Australia is a burgeoning industry. The connection with Bellsouth will enable us to take advantage of US technology and will provide us with a ready export market for our locally produced software and hardware." Neither Winters who will stay with the new owners for the time being, nor Bellsouth would indicate the takeover price. Industry observers speculated it may have been $A5 million.

Bellsouth is the largest of the holding companies created by the break-up of the old Bell system. It has assets of more than $US26,000 million and had a turnover of $US11,400 million last financial year. It is the seventh largest company in the US.

Link serves more than 38,000 paging subscribers and claims to be Australia's largest private radio paging operator.

Bellsouth's vice-president for the Asia/Pacific region, Thomas Hinton, pointed out that the company's acquisition of Link is an important step towards its commitment to global growth of telecommunications and technology. "In dollar terms, this acquisition is small, but, with 70 per cent of the population concentrated in urban areas, we see tremendous growth potential in this country," Hinton said.

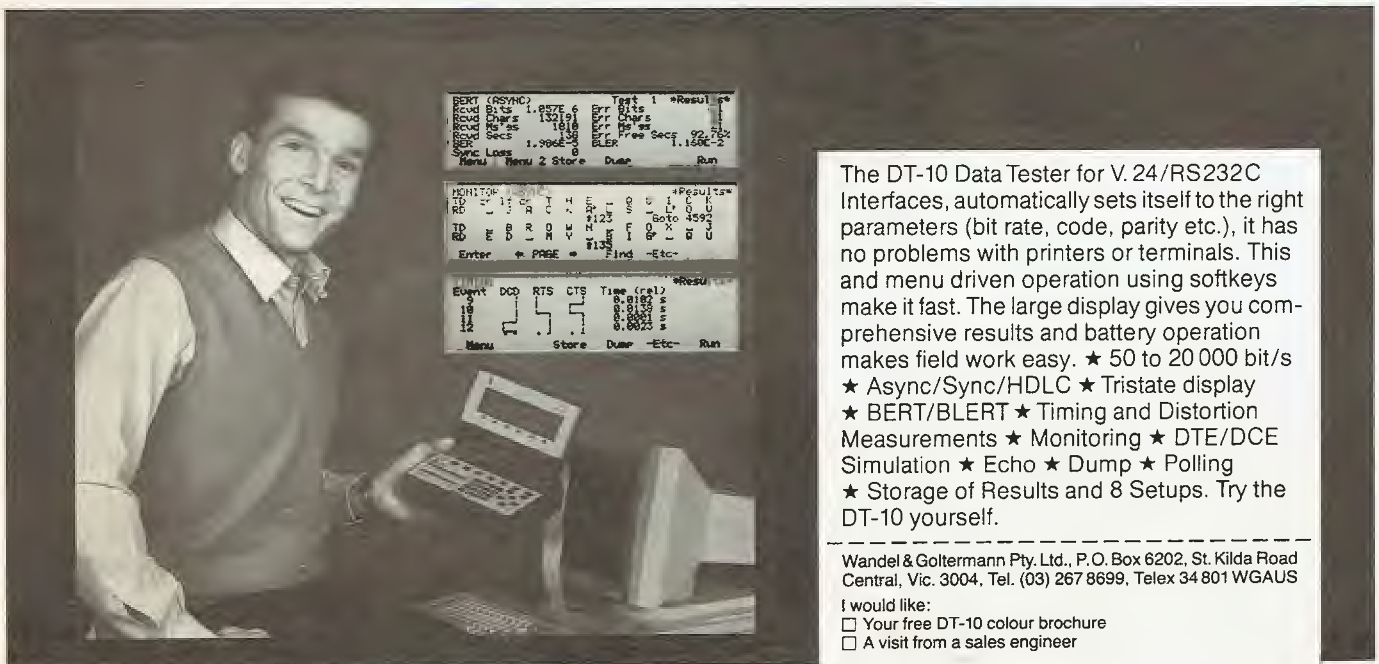
# High-speed Lan chip

SUNNYVALE, California — Chipmaker Advanced Micro Devices has launched its Supernet, a chip set for high-speed local-area networking using fibre-optic media.

Supernet implements the Ansi standard for a Fibre Distributed Data Interface (FDDI), which specifies 100M-bit/sec operation.

AMD's five-device Supernet reduces FDDI node implementation costs, making FDDI a commercially viable standard for the first time, according to the company.

"The chip set implements a complete FDDI node, replacing up to six boards of discrete integrated circuits and providing the same functionality at less cost, AMD said. Full production quantities are to be available by the first quarter of 1988 at $US625 per set in quantities of 100.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# Parry's Q-net a guessing game

*By Peter Young*

BRISBANE — The transformation of Queensland's Q-Net into a private satellite network owned by Perth tycoon Kevin Parry has sparked a guessing game about its future use.

He has an intriguing number of choices in front of him, according to a survey of experts in the field.

The most unimaginative would be to limit Q-Net to its present role as a delivery vehicle for Aussat satellite-based communications services to the Queensland government.

A second avenue — one carrying the risk of confrontation with Telecom — would be to offer voice and data circuits to non-government organisations.

But it is the system's potential for television broadcasting that stimulates most speculation.

One scenario has Parry forming an alliance with the QSTV consortium of seven regional television operators. Another suggests he could use Q-Net to beam programs from his Newcastle station into Papua New Guinea TV interests, or use it as a long-range springboard into pay-TV in Australia.

## 'Grossly overvalued'

From a strict datacommunications viewpoint, Parry Corp's winning $10 million bid grossly overvalued the Queensland network, according to one source close to Q-Net.

Others among the 34 defeated contenders for the system considered the bid reflected an over-optimistic assessment of Q-Net's ability to generate earnings.

One Parry Corp executive involved with the Q-Net deal predicted the majority of revenues for the next few years would continue to come from services provided to the Queensland government.

In other words, the new operator, Parry Corp subsidiary Icom Satellite Services Pty Ltd, will keep providing services for a fee that the government had been providing for itself. That would seem to downplay the possibility of pursuing private sector customers like mining companies which now use Telecom's premium-priced Iterra earth station service.

In the more restricted sector of straight data communications, Q-Net can deploy a number of earth stations but there are doubts about the size of that market in the non-government area.

It is widely believed that Parry's hidden agenda for Q-Net has to do with staking out a position from which to expand once the current chaos in the television and broadcasting industry hardens into new patterns.

For example, Parry is known to have had preliminary talks with the QSTV consortium which owns the Remote Commercial Television Service (RCTS) licence for Queensland.

A spokesman for QSTV noted no discussions have been held since the acquisition of Q-Net but said there would be no obstacle to Parry obtaining a share of the licence.

That could take Q-Net back to its original concept of a TV-based network for remote areas with added voice and data capabilities.

Given that TV signals only take up half the bandwidth, Parry could conceivably use Q-Net's 12 watt transponder to broadcast to remote areas while keeping the other half for fee-generating voice and data services. Through QSTV, Parry could also gain access to a 30 watt spot beam which would make remote area television services more feasible on a number of counts.

That would also open up the admittedly more remote possiblity of positioning Parry for the introduction of pay-TV.

The antenna pattern of the 30 watt beam can be switched to cover all of Australia and the BMAC technology now used in remote area service was originally designed with pay-TV in mind.

The rich range of possibilities highlights the opportunities awaiting entrepreneurs like Parry despite the legislative and legal uncertainties surrounding private satellite networks in Australia.

# OTC presses for change in status

*By Noel Bennett*

SYDNEY — The Overseas Telecommunications Commission would be able to improve its efficiency if it was formed into a private company with the shareholding owned wholly by the Federal government.

OTC executive made this point recently when announcing record after-tax profits of $A68 million for the financial 1986-87 year. The commission paid a $A40 million dividend to the government.

OTC had not entered the privatisation debate believing this was a matter for the government to determine.

Efficiency would be raised if OTC operated as a private company, similar to Qantas and Aussat, as the government could set a performance target and if not met, then the directors could be dismissed or the board could set new directions.

Private company status would also provide the opportunity to react more quickly to competition and advances in technology and with added flexibility in staffing and capital raisings.

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# Telecom slashes 50pc off Vistel comms cost

*By Luis Huesch*

MELBOURNE — Users of the Victorian government's telecommunications network will enjoy discounts of up to 50 per cent on usual Telecom pricing, Vistel's managing director Tony Newstead told government delegates here recently.

Addressing the Computing in Government expo/conference, Newstead also hinted that Telecom is resigned to the inevitable liberalisation of interconnect.

Newstead gave a resume of Vistel's state of affairs. He recalled that when the State government commissioned its telecommunications study two years ago, it was spending $A70 million a year on communications. This had grown to $A100 million/year and was tipped to grow 25 per cent a year.

The recommendation of the report was that at least $A20 million could be saved each year using a State network. Most of the State's telecommunications traffic (80 per cent) was internal, that is, between State agencies, said Newstead.

He pointed out that Vistel use is discretionary: agencies do not have to use it But they are attracted to it by big discounts — at least 30 per cent off Telecom tariffs, with the promise is of bigger discounts to come: up to 50 per cent off in three years' time.

Newstead once again stressed that the memorandum of understanding reached with Telecom for construction of the Vistel network represented a "win-win" outcome: Telecom could have used its prerogative of using the railway easements anyway, he argued.

But in offering to be co-operative ("they couldn't very well plough in the fibre from a track-based machine while trains are running as usual!"), Victoria had gained a number of key concessions in the four months of negotiations with Telecom.

These were:

- closed-interest-group conditions — "we achieved very good liberalisation for the (State Government's) inner agencies; (but) the outer agencies will be able to get bulk circuits"
- concessions on interconnection — "informally, Telecom foreshadows liberalisation", and
- de facto ownership of the transmission links — "which insulates us from Telecom tariffs".

Newstead said that "our fundamental social obligation policy helped in the negotiations", intimating that a non-Labor State would have fared worse. (The social obligation notwithstanding, jobs will go to produce Vistel savings: Newstead said 30 out of 100 existing PABX operators will no longer be needed because of network concentration.)

But there had been problems, including Telecom "reneging" on the question of full ownership of the network, citing its "obligation" of sole carrier.

Newstead noted that this premise "could have been challenged in the High Court".

Among his regrets was the fact that "we haven't got the same control — there can be disruptions". Instead, the construct of "irrevocable rights of access to stated transmission capacity" was agreed, together with an up-front capital contribution that was "remarkably close to what it (the network) would have cost us if we'd built it ourselves".

Interestingly, the terms of the arrangement allow Telecom to substitute existing installed capacity rather than string actual fibre along easements: the Vistel memorandum specifies only a "notional network", according to Newstead. Even the Central Business District loop for Vistel is "notional", that is, it will use installed fibre-optic cable.

Video-conferencing will be a major user of Vistel capacity, with daily Melbourne-Sydney conferences taking place even now.

Newstead spoke glowingly about Vistel's satellite operation, which he said was "very economical for data — it beats Austpac and DDS hands down".

**John Cain . . . concessions**

Connections cost $A300 per port "if you have 200 Vsats", each of which cost $A20,000 complete. Vsat users would pay $A3000 a year for the Vistel capacity, including up to 64K-bit/sec for data and facsimile. Applications ranged from message delivery to database access ("access to records saves a few hours a day for the single policeman in the mallee").

One-way TV applications were also possible, but it cost an extra $A3000 to equip each Vsat for TV reception, plus the "killer" of itinerant satellite TV charges of $A800 an hour, or perhaps $A500-600/h for bulk buyers. Vistel was looking to amortise the costs by spreading TV applications, with TAFE, other education institutions and the police being interested users, Newstead said.

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# DG scores a $10 million trading house network

SYDNEY — Data General has won a $A8-10 million order to supply a 530-terminal network with five MV 15000s, four MV 7800s and a MV 20000 mainframe to Sydney-based engineering supplier J Blackwood & Son Ltd.

The installation, following an 18-month selection process, is seen as giving a significant competitive advantage to the company, which claims to be the biggest national supplier of products, services and tools to the engineering and construction industries

Its 13 branches process some 8000 orders from its 60,000-strong customer base each day, for anything from floppy disks to heavy-duty industrial pumps, from a 110,000-item catalogue.

Blackwood's Sydney general manager Ian Lewis said: "The Data General system will play a significant part in strengthening a competitive foothold in customer servicing. The system provides a convenient method for customers to do business with us, and will give direct terminal access to our major customers, particularly those in remote mining and industrial locations."

Lewis said large customers would be given their own terminals and dedicated lines so they can access the system 24 hours a day. "For many customers, it will effectively mean paperless purchasing"," he said.

The order is seen as strategically important also for Data General Australia, whose managing director John Filmer said it "reinforces DG's supremacy in office automation (CEO) and networking."

According to Lewis, DG was chosen for its "speed of installation and a proven, low-risk, commercially demonstrable solution" to Blackwood's requirements, particularly since DG offered a one-stop software solution incorporating Australian packages.

The system, claimed to be the first of its magnitude in Australia, will provide inventory control, forecasting and management information and integrated accounting and finance. Electronic mail, available under CEO, will be integrated with customer access systems, telemarketing systems and office automation tools from Wilson Computer Services, who also provided the distribution software.

# Low-cost 14in HP terminals debut

HEWLETT-PACKARD Australia has released a series of five low-cost 14in terminals including plain Ascii, DEC and IBM alphanumeric screens and two new HP screens. Entering the PCM terminal market as worldwide shipments are tipped to soar from 2.6 million units this year to 3.6 million in 1991, HP said it wanted to be "a strong vendor" in non-HP terminal markets.

The new HP 700 terminals are only the first step toward offering a complete workstation family. The series includes the HP 700/41 Ascii terminal at $A740, the $A1250 DEC/Ansi 3.64 compatible HP 700/41, the $A1500 IBM 3191-compatible HP 700/71, and the HP 700/92 and /94 terminals, which replace the HP 2392A and HP 2394A, offering more features at the lower prices of $A1800 and $A2200, respectively.

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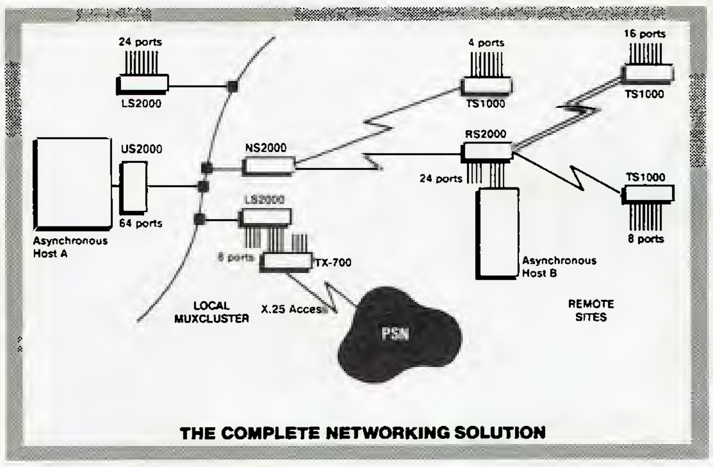

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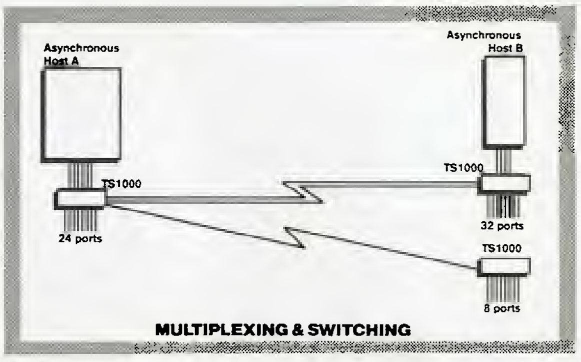
These high performance mux's transfer data without interpretation and remain totally transparent long after other mux's have had their shortcomings exposed.



MULTIPLEXING & SWITCHING

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The four channel statistical mux that meets today's needs for a single point to point link can grow with you to support thirty-two channels and provide switching when it is needed.

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Multiple paths between sites can be established by using the four high speed composite links available on ComDesign networking multiplexers.

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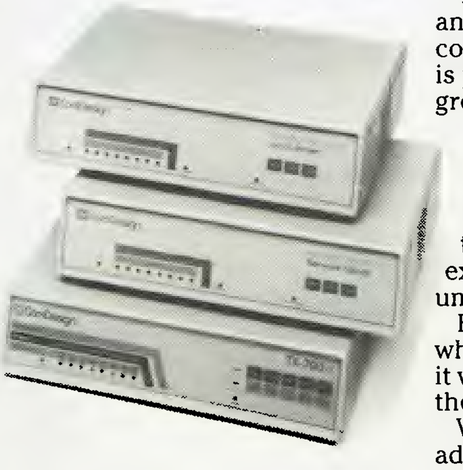

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GUEST EDITORIAL

# *Are ISDN standards obsolete?*

*NEXT year the CCITT will ratify the first complete set of Integrated Services Digital Network standards, and equipment companies will charge ahead in a final dash to bring compliant products to market. The question, however, is whether the standards are right for today's voice and data needs.*

*Nearly a decade in the making, the ISDN standards are viewed as the foundation of the next generation of interfaces to public voice and data networks around the world.*

*The first ISDN interface standards, to be ratified next year, define the basic information bearing, or B, channel as a 64K-bit/sec pipe that can be circuit or packet switched. Voice calls are carried on a B channel in circuit-switched mode. Data connections can be either circuit or packet switched.*

*The 64K-bit/sec channel is ISDN's basic unit of capacity. When the standards were being drafted in the early 1980s, this speed was right as a universal standard for digitising speech (pulse code modulation), and it seemed to provide more than enough capacity for most data needs. Ironically, now that the lengthy international standardisation process is finally nearing ratification, 64K-bit/sec may no longer be the right choice.*

*On one hand, digital speech techniques have advanced, and it is now routine to compress a voice call into 32K-bit/sec and retain the quality that 64K-bit/sec techniques provide. Is it wise to base a worldwide upgrade of telecommunications networks on a standard known to take at least twice as much capacity as needed?*

*On the other hand, the rise of local-area networks is changing the requirement for wide-area data communications. Fairly large pipes that provide local net-to-local net transfers are needed and 64K-bit/sec B channels may not provide enough throughput for connecting local-area nets that range from 1M-bit/sec to 120M-bit/sec. If fibre-optic technology becomes widespread during the next decade, it may revolutionise users' assumptions concerning the capacity requirements for data. Megabits, not kilobits, may be the right units in which to measure the basic data channels of the 1990s.*

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- Our guest editorial is by James Herman, a telecommunications consultant and contributor to *Network World*.

COMMUNICATIONS WORLD

**Editor:** Luis Huesch
**Contributing Editors:** Tom Amos, Noel Bennett
**Production Editor:** David Blackburn
**Communications World is part of the CW Online News Service, which includes sister publications Network World and Le Monde des Telecoms.**

**ADVERTISING:**
**National Advertising Manager:** Terry Swan
**Western Australia:** Winkie Corfield (09) 384 5856

**CIRCULATION:**
**Manager:** Shirley Ingran
**Supervisor:** Dorothy Adams

**PRODUCTION:**
**Manager:** Max Jaeger

**MANAGEMENT:**
**Publisher:** Alan Power
**Communications World is published by Computerworld Pty Ltd**
**Managing Director:** Alan Power
**Directors:** Patrick J McGovern
W Walter Boyd
**General Manager** Barbara Howell

Computerworld Pty Ltd also publishes: *Computerworld Australia; Australian PC World; Australian Macworld; Greenbook of Software and Related Services.*

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*Communications World* is published monthly and distributed to qualified charter subscribers in the communications industry.

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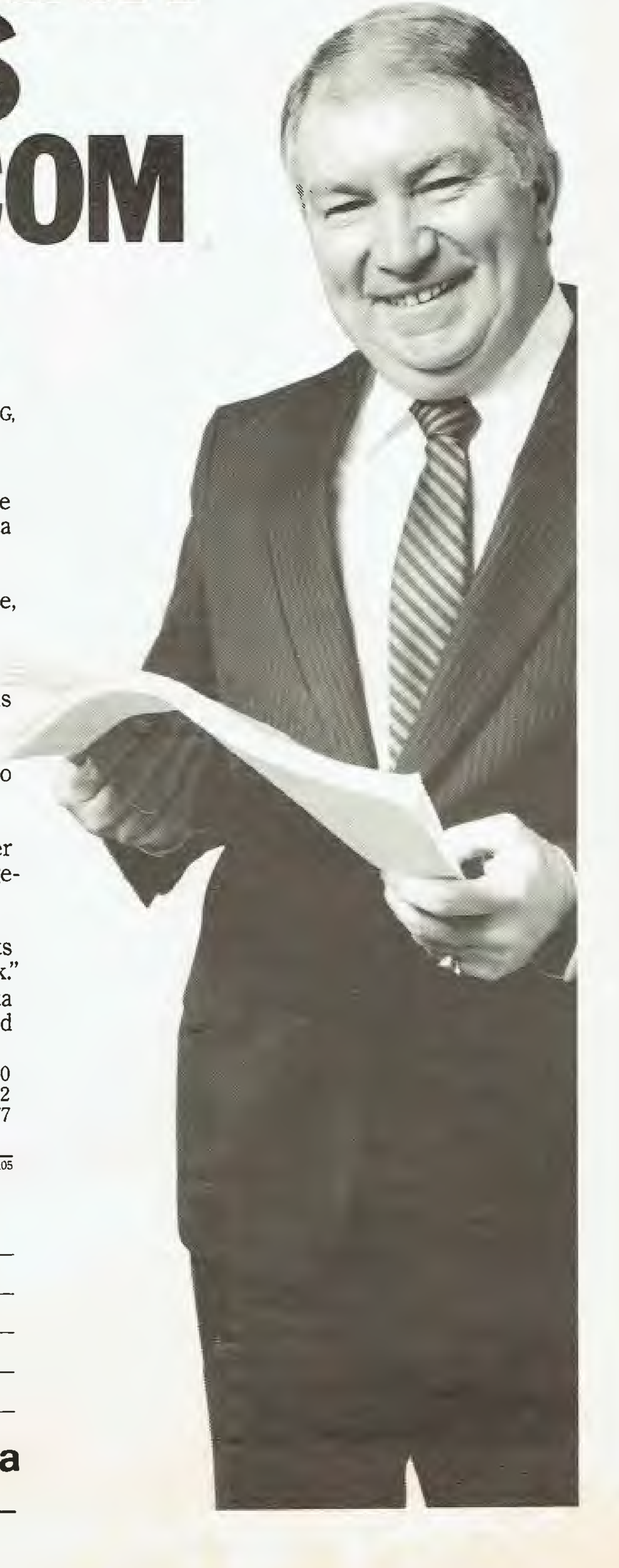

# COS unveils OSI test

*By Karyl Scott*

MCLEAN, Virginia — The Corporation for Open Systems (COS) , welcoming Bell Atlantic Corp and Vance Computer Systems, to its ranks, has introduced five Open Systems Interconnect (OSI) software testing products that will be available by year-end.

COS is a nonprofit consortium of 65 computer and communications companies and 19 user affiliates founded in January 1986 to develop tests for product interoperability.

One of the five testing products COS unveiled, the Transport Protocol Test System, has already been shipped to members taking part in the June 1988 Enterprise Networking Event In Baltimore. The show is to demonstrate interworking between Manufacturing Automation Protocol/Technical and Office Protocol (Map/Top) Users Group, the US National Bureau of Standards OSI Workshop and COS members.

## First step

COS Chief Executive Officer Lincoln Faurer said release of the product represented the first step toward achievement of the group's goal of "accelerating the introduction of multivendor, interoperable products compliant with OSI and other international standards.

Other testing products introduced include the 802.4 Token Bus test system, which will be sent to COS members this month; the Internet Protocol and the File Transfer and Access Management (Ftam) Protocol test systems, scheduled for November release; and the Message Handling System (MHS) Protocol test system, to be released in December.

The new Transport Protocol tester runs on a Sun Microsystems Sun-3/160 workstation and enables vendors to test their communications products for conformance to the OSI Transport Protocol standard, which corresponds to Layer 4 of the OSI model.

The test software was developed in conjunction with the British National Computer Centre. COS will begin certifying vendor products around mid-1988, said Faurer. Products which pass COS testing will be affixed with the COS seal.

## Van plan

**SEOUL — Business conglomerates in Korea are gearing up to participate in the value-added network (Van) business. Among those poised to enter the new market are Samsung Data Systems (SDS, a joint venture with IBM), Systems Technology Managements (SMT, which includes EDS as a partner) and Korean Airlines.**

**A startup from the Hyundai group with the US Martin Marietta Co as a partner reportedly plans to enter the South East Asian Van market.**

**Traditionally, local data communications services have been controlled by Data Communication Corp (Dacom).**

**However, under pressure from the US to open the domestic data communications market, the Korean government has recently authorised three companies to use the packet-switching lines for intragroup Van services, provided they adhere to the carrier's X.25 protocol.**

# 32-bit Theos lets 128 tap into one micro

WALNUT CREEK, California — Theos Software Corp has announced a mainframe-style 32-bit operating system said to allow up to 128 users to tap into the power of one 80386-based microcomputer.

The $US799 multi-user multitasking program can physically address up to 4G-bytes of memory, and has a virtual memory space of up to 64T-bytes in the protected mode. I/O redirection and command pipes make Theos 386 compatible with the PC/MS-Dos and Unix operating systems.

Theos 386 is aimed at users who want to move from mainframe and minicomputers to less costly microcomputers. Theos chairman Timothy Williams said he believes users may start migrating downward as powerful 386-based micros blur the lines between large- and small-system performance.

Theos 386 is scheduled for commercial release in January 1988. OEM porting began in September, while application porting will be ready in November, company officials said.

The company also announced Theos C, a $US599 companion C compiler that meets the forthcoming Ansi C standard and features Unix and Dos source code compatibility.

A full development kit — consisting of Theos C, Theos Basic and a Script text processor — will be available for $US1599.

Theos has an installed base of about 70,000 licensed copies of its operating systems, including software that runs on 8- and 16-bit computers, according to a spokesman.

Like earlier Theos operating systems for the Intel 80286 chip, Theos 386 uses much of the programming and many of the same command names found in mainframe and minicomputer environments.

Mainframe-like features include a user interface similar to the one on the IBM VM/CMS, the Exec job control language, a full screen editor and sophisticated index files.

# Add-in speeds up Appletalk

*By Laurie Flynn*

BERKELEY, California — In an effort to position its Tops Appletalk-compatible file server as an IBM PC-to-PC solution, Centram Systems showed a new version of its program that enables IBM PCs on a network to transmit data at three times the speed currently supported by Appletalk. The new version of Tops for the IBM PC will support transmission speeds of up to 770K-bit/sec, while Appletalk runs at 234K-bit/sec.

The software update takes advantage of a feature built into Centram's add-in Appletalk card for IBM PCs that enables those systems to transmit at the higher speed, according to the company. A new driver features a switch that enables IBM PCs to communicate with other IBM PCs at the higher speed and with Macintoshes at Appletalk speed. This enables the IBM PCs to support two speeds at once, according to Centram.

Scheduled for fourth-quarter release, the new version will be available to current users for an undisclosed, nominal fee.

# *Soft-Switch unveils e-mail backbone*

BOSTON — Moving to take a leadership role in corporate network building, Soft-Switch, has unveiled an electronic mail backbone that brings IBM's Systems Network Architecture Distribution System (Snads) to the VM operating system for the first time.

Running the new Soft-Switch Central/VM software package, a VM host — most likely the IBM 9370 — will switch electronic mail and editable documents from multiple vendors through Soft-Switch gateways.

"Large accounts need a backbone environment. The 9370 is clearly going to be IBM's communications gateway box," said Michael Zisman, Soft-Switch chairman and chief executive officer.

IBM currently does not offer Snads under VM but offers it as part of its Distributed Office Support System (Disoss), which runs under MVS. In addition, Snads is included in IBM's Personal Services/36 for the System/36 and the Personal Services/38 for the System/38. Professional Office System (Profs) is IBM's electronic mail protocol supported under VM.

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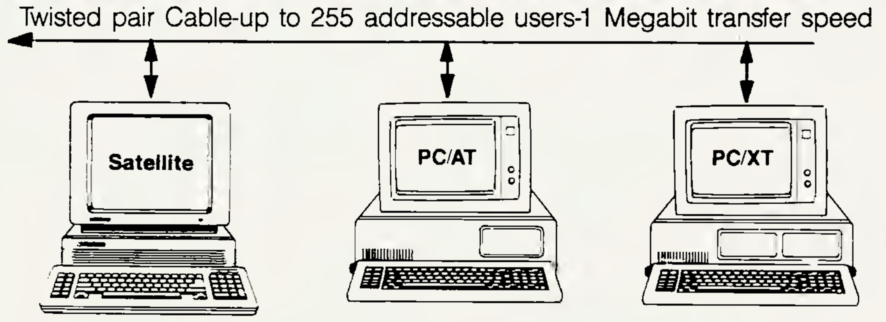
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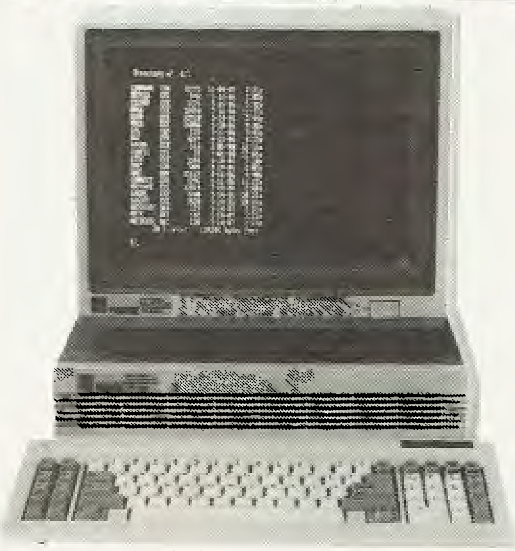

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# Asian nations meet to set the stage . . .

TOKYO — Telecommunications representatives from about half dozen Asian countries, including Japan, Korea, Malaysia, Singapore and Thailand, met in Tokyo recently to lay the groundwork for compatibility among their evolving ISDN networks, regarded as critical to their economic and technological progress.

South Korea, in particular, sees telecommunications as a key stimulant to economic growth. It is in the initial phase of constructing an integrated digital network, which should be evolved into an ISDN by 1992.

From 1992 to 1996 the ISDN will be rolled out as a pilot experiment in main cities, and then commercialised and connected to existing networks developed between 1987 and 1991. From 1997 to 2001 the ISDN will be expanded with more services.

Malaysia also wants to add ISDN features to its telecommunications network, but it will take at least five years, according to its top Telekom official, who said the country is moving toward having 80 per cent of its telephone exchanges and 70 per cent of its transmission services digitised by 1990.

Singapore Telecom will continue to digitise its existing network. The long-term view is to offer all services from a future ISDN. Singapore already holds a pre-ISDN trial test using 320,000 digital switching lines from Fujitsu.

Thailand is also installing more digital transmission systems in its move toward an ISDN network.

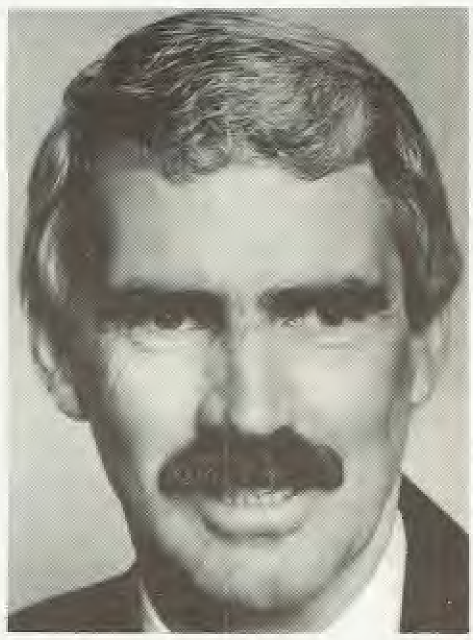
Japan is perhaps the furthest along in its ISDN effort, having already concluded an ISDN trial, and being set to offer all-digital ISDN services early next year via a Nippon Telegraph & Telephone network.

Japanese telecommunications groups also plan to propose an ISDN standard to the CCITT late this year.

The extent of the Asian co-operation and the possible establishment of a committee for joint ISDN study was due to be voted on by participating countries early this month.

# Private nets will survive

*By Garry Fahey*



Garry Fahey is director and general manager, Timeplex Australia.

INTEREST in ISDN has increased sharply in recent months, with many articles and announcements appearing in the industry and even the popular press. If you were to believe all the claims made about ISDN, you would think it signals the decline and eventual disappearance of private telecommunications networks. In fact, ISDN will complement and may significantly broaden the private network market.

To understand this, it is necessary to review the current use of private networks by major corporations.

The integrated private network allows the user to interconnect his total voice and data facilities. The data links to each node may be a combination of terrestrial, satellite or radio, common carrier or privately provided. Digital PABXs may be interconnected with analogue PABXs, voice compression may be used, bandwidth may be allocated to resources on demand and alternate routeing automatically implemented in the event of data link failure. The user maintains total control via one network management system.

To many corporations in Australia and throughout the world, the communications system is the life blood of their business. They depend on the facilities provided by their private networks to exchange information quickly, accurately and reliably; to facilitate better and more timely decisions; to offer more competitive customer service and to reduce operating costs.

The integrated private network allows the corporate communications manager to manage network resources and quickly adapt them to take advantage of business opportunities. The communication system is frequently a major factor in providing the user organisation with the competitive edge in business.

Most private network users rate control of their telecommunications environment to be just as important as, or more important than cost savings in contributing to the profitable operation of their business.

With the emergence of software-defined networks and ISDN services, common carriers around the world have forecast the demise of private networks.

However, private networks will continue to grow for two reasons: price performance and user control.

*(Continued page 12)*

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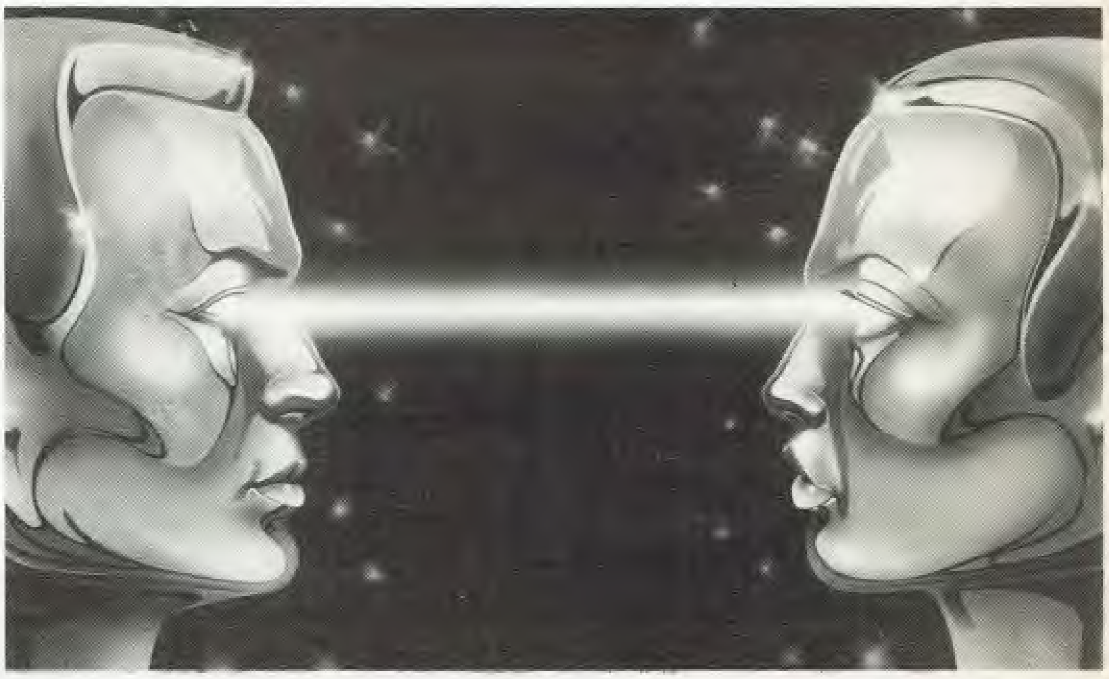
# Seeing eye to eye on ISDN . . .



THE Integrated Services Digital Network will eventually cover most of the planet, bringing the much-touted global village concept that much closer to reality. The major countries are expected to be supported ISDN by about the time Australia "comes onstream" in 1988/9, and the Overseas Telecommunications Commission believes it will be ready with access to international ISDN facilities at that time.

The forces driving ISDN installation worldwide are usually not those of the marketplace — except in rare cases mainly in North America — but the technology "push" of the PTTs, including Telecom Australia. According to Ericsson's assistant technology director Peter Brown, the PTTs are driving ISDN as a means of getting back control of private networks, where they are losing out badly now, particularly in voice traffic.

On the road to building a global ISDN, several milestones have yet to be passed: the issue of standard interfaces for all facilities the network can provide; the scope of services that will offered; signalling standards and the interworking of users on non-ISDN networks. According to a recent paper by the OTC's network development specialist Peter Lakmaker, ALL ISDNs will support speech bearer services; 3.1kHz (voice band data) bearer services; and 64k-bit/sec unrestricted bearer services. Most will also support packet bearer services.

### Bearer services

But network teleservices will not be supported consistently around the world: while all ISDNs will offer telephony and facsimile and most will support teletex and videotex, only some ISDNs may support telex. PTTs and — in deregulated environments — alternative carriers go about building their networks along two distinctly different routes, notes Lakmaker. In Europe PTTs are concerned with enhancing public facilities such as abbreviated dialling and calls to busy numbers. In North America, carriers are more involved with offering private facilities enhancements such as central-office switching, closed user group links and user-to-user signalling.

Most countries, however, will go into ISDN with proprietary protocols for the service enhancements (ISDN user part, or ISUP protocols), for which standards are slow in coming together. The UK, for instance, is already operating an ISDN-type service based on Plessey's proprietary implementation. For the network (telephone user part, or TUP) side signalling protocols, standards are "fairly stable" now, according to Lakmaker. Standards for interworking between ISDN and dedicated networks are expected to be in place next year. International bilateral signalling should also then be possible, followed by more general multilateral signalling based on mapping national to international protocols.

OTC intends to provide international network capabilities that support services available on the Australian ISDN "and other internationally required services". But it cautions that the initial differences in the global ISDN will impose "restrictions on services or destinations on (ISDN) introductions".

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# Nets gain architectural freedom

*By Norman Gale*

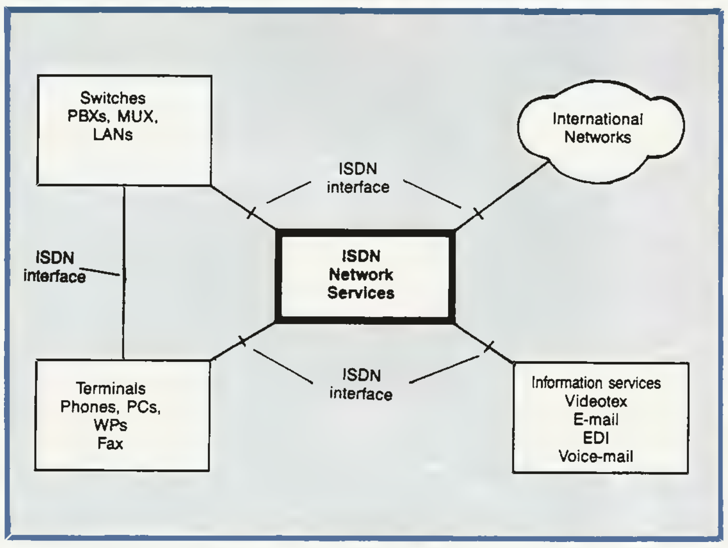
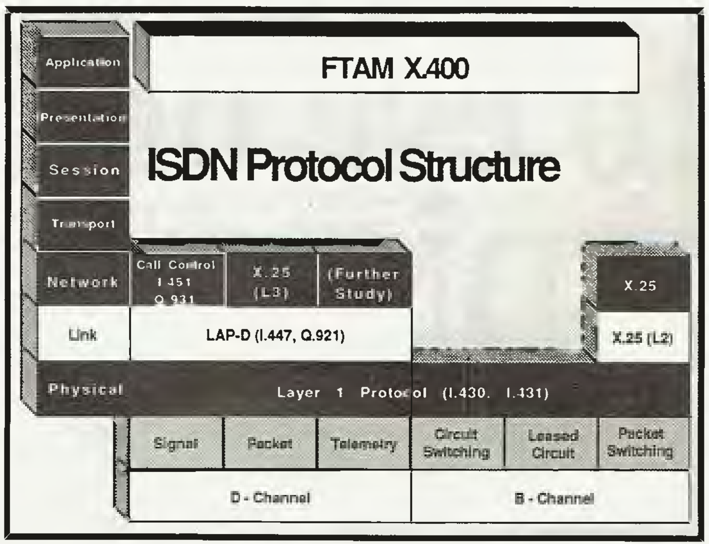


**Figure 1: Flexible ISDN architectural framework.**



CW Chart: Lisa Romano

**Figure 2: Integrated access from ISDN platform.**

THE Integrated Services Digital network (ISDN) being introduced in Australia by Telecom in 1988/89 will provide a flexible, high performance network for the advanced communications services used by the information society of the 1990s.

The key feature of ISDN is the standard user interface which provides integrated digital access to a variety of communications services. The separate control channel available at this interface allows users to negotiate directly with the public network for access to voice, data and text services such as teletex, fax and videofax and videotex services in either point-to-point, circuit or packet-switching modes, as well as obtain a number of supplementary services such as calling number identification, and meter enquiry.

Corporate users will be the first to benefit from integrating their corporate networks with ISDN, particularly as they use ISDN to incorporate their smaller sites into those networks.

> ‘As well as the benefit of higher performance, real cost savings are a possibility’

Telecom's initial ISDN offering will be a 2M-bit/sec multi-channel access interface, allowing digital PABXs to be connected directly to the digital public switched network, and providing integrated access to circuit-switched, cross-connected and temporary tie line services. It will be available in the central business districts and selected metropolitan areas of the six mainland capital cities.

By mid 1989 a 144K-bit/sec "slim channel" access will be available to support the 2M-bit/sec service for smaller branch and regional office networking. Future service enhancements will include call diversion, called line identification, reverse charging and closed-user-group features.

Beyond the individual services offered on ISDN are the architectural implications for the corporate user, which will see their communications options expanding rapidly.

There is now a proliferation of Lans, digital PABXs, terminal and multiplexers on the market. Unfortunately, much of the advantage to be gained from digital technology is constrained by proprietary interfaces. Systems cannot be expanded or upgraded, unless a single supplier policy is adopted within the corporation.

ISDN provides a **non-proprietary** architectural framework for the interconnection of systems and terminals from a variety of suppliers. As an architectural framework, ISDN allows standard communications building blocks to be interconnected in a flexible manner, tying together network services, terminals, switching systems and information services (see figure 1). ISDN is not simply a circuit-switching network, although it does improve the cost-effectiveness of circuit switching as a communications medium. By offering integrated access to packet-switching and dedicated point-to-point circuits (see figure 2), ISDN opens up a new architectural freedom not available on current networks. Changing corporate communications requirements can be accommodated within ISDN without massive changes to existing equipment — if it is ISDN-compatible.

As well as the immediate benefit of higher performance communications to a corporation, ISDN offers the possibility of achieving real cost savings.

The major areas in which cost reductions can be achieved include:

- Reduced access costs through integrated access to a range of network and information services.
- Productivity improvements achieved through higher speed communications and improved reliability of communications services. This includes the use of high speed file transfer, high speed facsimile and picture videotex services.
- Long-term cost reductions as the standardised multipurpose interface electronics become cheaper than low-volume specialised interfaces.
- Reduced recurrent costs through the use of single-channel digital tie-lines; virtual private networks; low-cost digital transport; and network rationalisation.

Two sample networks demonstrate the relative recurrent costs of ISDN in the metropolitan area. The further benefits of integrated digital networking, integrated data/voice and productivity improvements have **not** been included in the analysis.

In the first example, a metropolitan tieline network (see figure 3) the recurrent exchange access and tie line costs associated with the current network are:

*(Continued page 18)*

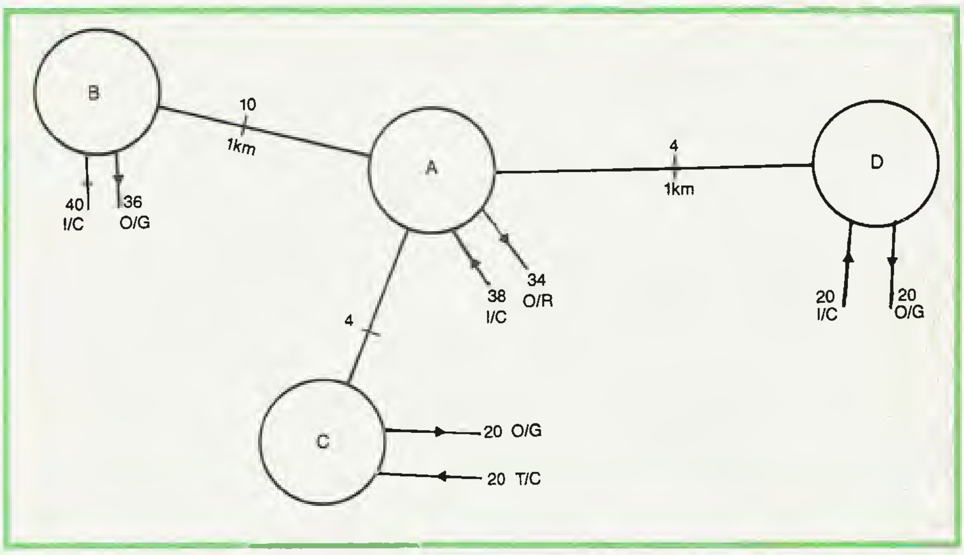


**Figure 3: Existing metropolitan tieline network.**

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# Private nets will survive

*(Continued from page 10)*

On the pricing side, the dedicated transmission service will always be substantially less expensive than the high availability, peak demand supporting switch services. Moreover, with dedicated facilities, higher levels of performance can be guaranteed.

On the control side, users will continue to choose dedicated facilities when sensitive information is transported.

ISDN, will, however, be very important to private network operators as it will enhance their networks, thus expanding business opportunities.

Hybrid networking (the integration of public and private networks by the private network node) will give users flexible access to the primary private backbone network and to the emerging public network. It will enable them to achieve the best price performance for the networking applications required to manage their business.

Using ISDN, remote users whose volume of traffic does not justify dedicated links, may access the private network bringing uniform procedures and information access to the smallest remote facility.

ISDN will also provide an introduction to private networking for the users who have held off investing in a network until they have seen that the new applications and services will work successfully in their businesses.

Using ISDN as an entry-level service, users may test new applications without the need to first instal a private network. Many of these users will later develop sufficient traffic to justify a private network.

The private network will continue to be the backbone of large organisations, as it will be the focus for the integration and management of the heterogenous combination of system and transport facilities (both ISDN and non-ISDN) that exists in the user environment.

# Pipeline will grow into a window

*By Rex Lehmann*

IN LESS than a year from now Telecom will launch what amounts to a new era in Australia communications.

ISDN is the concept that will revolutionise the way businesses communicate, and eventually it will reach down into the private home. Beginning next year, Telecom will make available some early services through a 2M-bit/sec digital "pipeline" that will be of prime benefit to larger organisations. From that point ISDN will grow to be a "window" into all communications (Diagram at right illustrates Telecom's initial offering).

Like any new services in a rapidly developing technology, the intended benefits can easily be lost through misunderstanding leading to misjudgment.

Therefore, it is important to keep in mind that at this early stage:

- Only limited services will be available, and
- basic changes to the service may be possible as relevant standards are established.

At first, the real benefits of ISDN will be financial savings for large users of voice networks. Interface to DDS initially will not be available and Austpac access will be limited to a semi-permanent service.

Telecom's 1988 release will be the primary rate access (PRA). It is priced to present some advantages to organisations requiring around 20 long-distant voice tie lines. Accurate cost justification requires more details from Telecom.

PRA involves subdividing, a 2M-bit/sec trunk into 30 sub-channels, each of 64K-bit/sec (known as B, for Bearer, channels) and a special 64K-bit/sec channel (known as the D, for Data channel).

The B channels will carry user digitised communication including voice, data, fax, telex, video, and Cad graphics. The D channel will be used to transmit network signals for such tasks as negotiating between the network and user equipment and establishing connections for user data traffic.

PRA will attach to PABXs capable of interfacing to both 2M-bit/sec trunks and addressing multiple 64K-bit/sec sub-channels. The users PABXs must also have the capability of a limited dialogue set with ISDN signalling in the D-channel.

Users will need to determine not only potential cost advantages but service level requirements. These will be affected largely by their choice of interface equipment and its degree of compatibility with Telecom's standards.

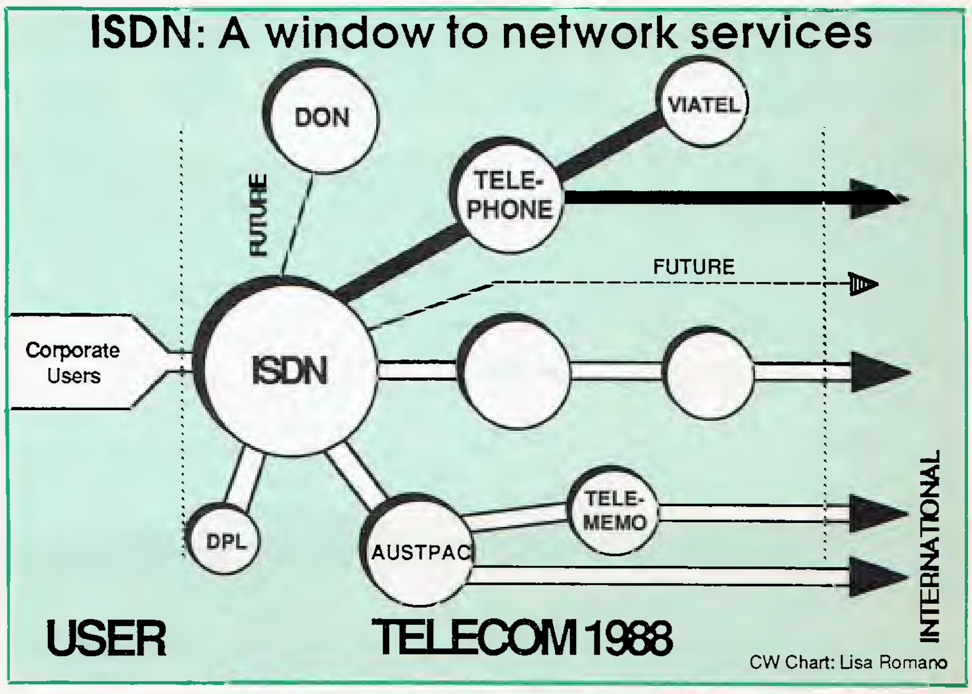
The more far-reaching decisions will also entail bearing in mind that the above documents outline a version of the CCITT I-series standards that may differ from the standards ratified by CCITT at its plenary session in Melbourne next year.

Although high-volume voice traffic will be the initial justification for ISDN in 1988, it will be possible with the correct interface equipment to further justify its use through dynamic allocation of bandwidth to some data transmission services. This could well mean an overall savings and ease of access to a mixture of telephony and data transmission.

The remainder of this decade will be a period of rapid transition requiring a closer awareness of many factors. They will include being able to balance a complex arrangement of costs, and answers to questions like:

- Should I use Austpac in combination with ISDN, or separately, or even at all?
- When should I move some or all of my voice traffic to ISDN?
- What PABX, or other, interface equipment presents the best investment for this transition period?
- How does ISDN affect my current packet-switching network?
- Can local area networks be efficiently interconnected via ISDN. If so, how?

● *Rex Lehmann is strategic marketing manager with JN Almgren Pty Ltd.*



CW Chart: Lisa Romano

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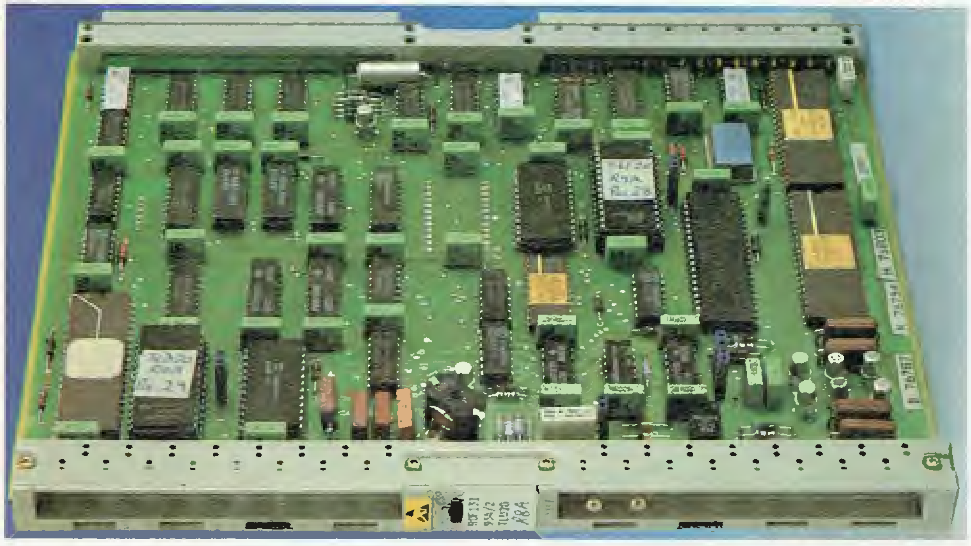
# The user's guide to ISDN



*By Peter Brown*

THE introduction of ISDN next year will be the start of the most dramatic advance in communications since the advent of automatic telephony. But for the average potential user, the advances promised by ISDN are hidden by two clouds.

The first is the cloud of technical jargon, with ISDN conjuring up a string of PRAs and BRAs, 30B + Ds and 2B + Ds, Q.921, I.412, D-channels and link access protocols (LAPS).

The second cloud is the emphasis placed on the public ISDN network, with its permanent virtual circuits, CCITT No 7 common channel signalling and packet-mode bearer services.

But ISDN can be much simpler for the potential user. It can be explained in terms of how a user moves from his digital PABX switching system to an ISDN environment, what the user sees in terms of pieces of equipment, what services are available to that user from his telephone and data terminal, and what other aspects of ISDN are more evident to the system manager rather than to each individual user. This user's viewpoint of ISDN will be described here.

## What is ISDN to the user?

There are a number of key features of ISDN that translate into real and important services to the user. The most basic of these features is an end-to-end digital path. Whereas a user today with a modern digital PABX obtains many advantages including voice/data integration from the digital switching inhouse, these are lost when the connection extends into the network.

The second key feature is that ISDN provides standardised interfaces, between the user's PABX and the network, between the PABX and other PABXs and between the PABX and the communications terminals — telephones and data terminals — that the user connects to the PABX. This allows the user a degree of vendor independence, both in the choice of his switching system and in the choice of his terminals.

The standardised interfaces also provide integrated access into the ISDN world. Rather than forcing the user to instal dedicated lines and dedicated interface equipment to a wide range of communications services — the telephone network, Austpac, DDS, telex, teletex — the one standardised interface will provide a transparent "pipe" into these services.

The essence of ISDN is that it provides to the user an intelligent data link between the user's PABX and the ISDN network, and between PABXs. This intelligent link is an inherent feature of the Common Channel Signalling method that forms the basis of ISDN. It provides the user with direct access to the intelligence of the public ISDN network. This direct access allows the user to request any of the wide range of services listed earlier as well as other services as they are added to the ISDN network. It will also allow direct user control of the way in which network resources are allocated to the user.

In the distributed organisation, ISDN is the platform for the business group concept, whereby the user can implement his own private network within the public ISDN network. This provides considerable flexibility in planning the growth of private networks. It also ensures that new services can be readily incorporated.

## Migration

It is critical for a user with a substantial investment in a modern digital PABX to be provided with a graceful migration path into the ISDN world. A wholesale change-out of processors and digital switches should not be necessary.

A typical modern digital PABX — such as the MD110 — already uses a number of ISDN-like interfaces. Digital trunk circuits are available which provide a 2M-bit/sec 30-channel capability and which also use a common channel signalling method. An ISDN trunk circuit should be implemented in a similar manner and should be able to co-exist with the existing trunk circuits, both digital and analogue.

On the user's side of the PABX — at the extension telephone — such a graceful migration is also required. Most modern

(Continued page 18)

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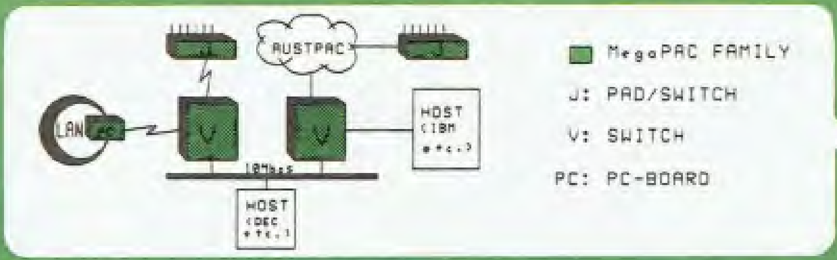

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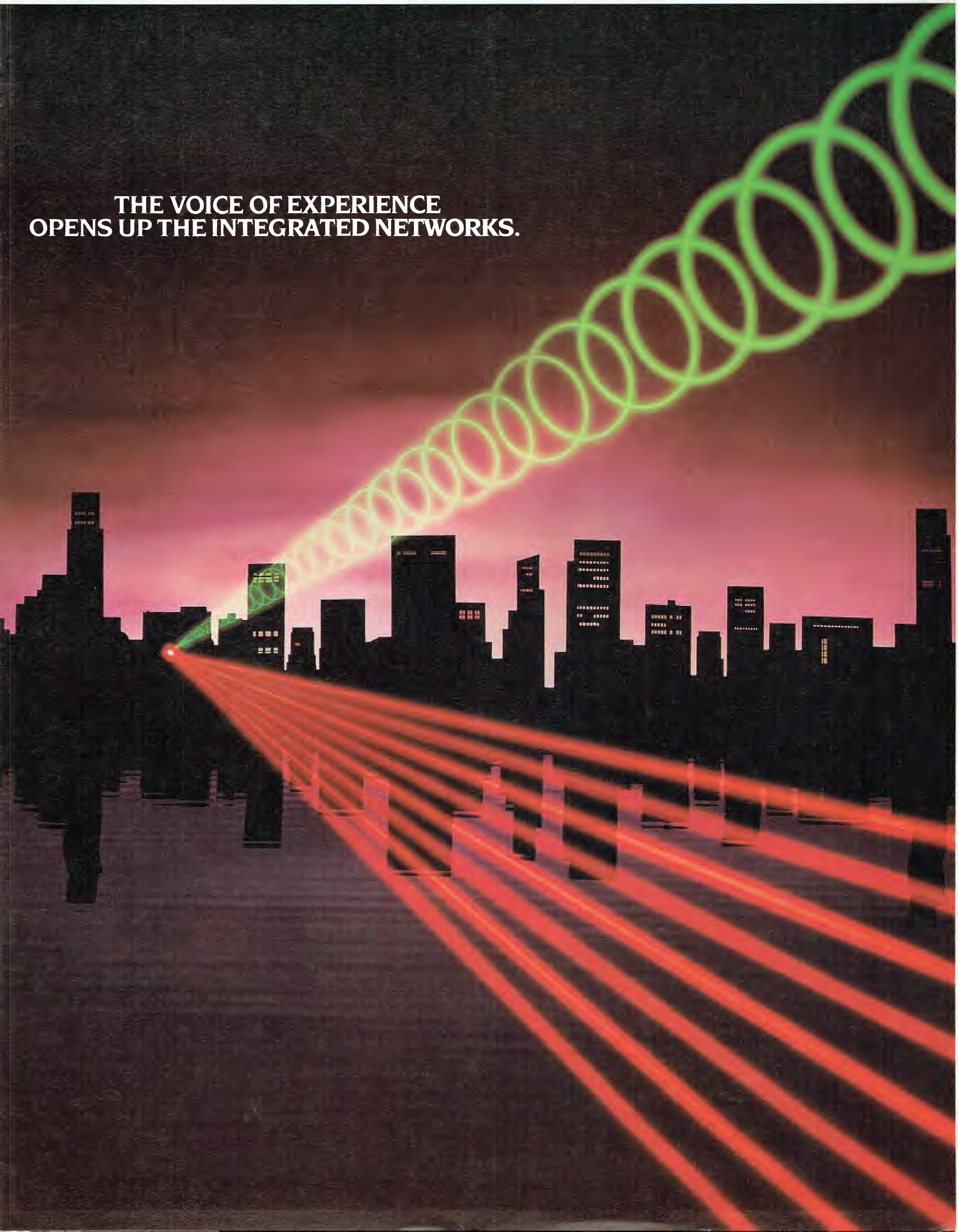
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# Nets gain architectural freedom

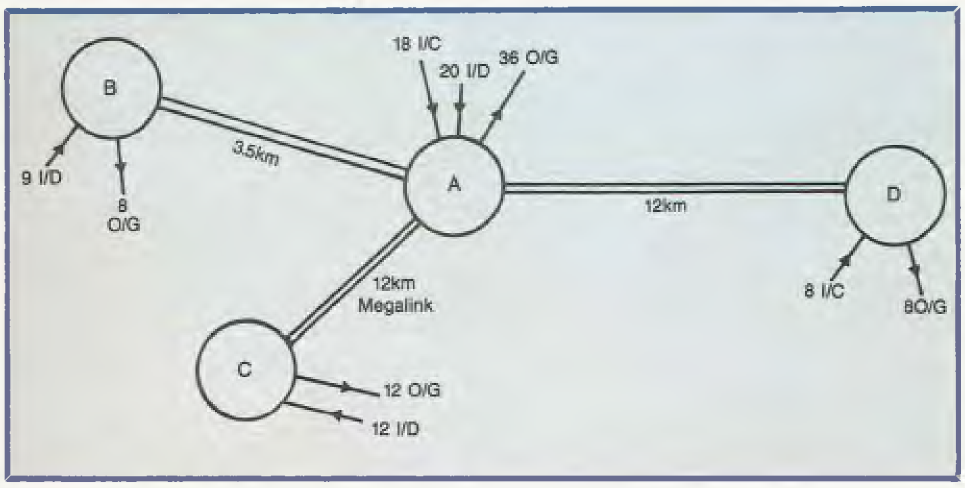

**Figure 4: Existing metropolitan Megalink network.**

*(Continued from page 12)*

| | ($A) |
|---|---|
| Exchange | 26,700 |
| Indial | 42,300 |
| Tie Lines | 16,700 |
| | $A85,700 a year |

The recurrent network access and dedicated circuit costs associated with an equivalent (optimised) ISDN solution are:

| | |
|---|---|
| Network access | 67,600 |
| Dedicated links | 8,200 |
| | $A75,800 a year |

In the second example, a metropolitan Megalink network (see figure 4), the present recurrent exchange access and megalink costs are:

| | ($A) |
|---|---|
| Exchange | 19,200 |
| Indial | 18,200 |
| Megalink | 75,200 |
| | $A112,600 per annum |

The recurrent network access and digital dedicated link costs associated with an equivalent functional (optimised) ISDN solution are:

| | ($A) |
|---|---|
| Network access | 50,000 |
| Dedicated links | 40,300 |
| | $A90,300 a year |

Final dedicated tariffs for ISDN will be available by the end of 1987 to allow potential users to assess the financial benefits of ISDN to their own corporate network.

Companies in the process of developing their three- or five-year network plans, particularly those considering upgrading second-generation PABXs, should seriously consider ISDN as a robust architecture for their corporate work.

- *Norm Gale is ISDN marketing manager with Telecom Australia.*

# User's guide to ISDN

*(Continued from page 14)*

PABXs offer a digital telephone to which a data terminal can be connected. The user will want to have ISDN service at the desk using existing telephones, existing wiring and existing data terminals.

### Hardware and software

Just what will the user see when he is connected via a modern digital PABX with ISDN capabilities to the ISDN world? It will in fact be something of a disappointment. The introduction of ISDN should require only a modest investment for the user and his digital PABX will appear much the same as it does today.

The 2M-bit/sec ISDN primary rate access from the network will terminate in a small Line Terminating Unit (LT) which interfaces to the network and provides network facilities such as powering, transmission termination and service monitoring. The LT is particular to the type of transmission line used in the network (coax cable, optical fibre, microwave, pair cable) and connects to the Network Terminating Unit type 1 (NT1) which provides the ISDN standard interface. It includes functions for line termination, line maintenance and performance monitoring, timing and power transfer.

The NT1 then connects to the ISDN line circuit of the PABX. This should only be a single printed circuit board which supports the 2M-bit/sec ISDN Primary Rate Access and which will normally include some onboard processing power to handle the lower-level aspects of the ISDN signalling.

There will be a small package of software to load into the processors of the digital PABX. If this is a modern digital PABX, the ISDN software would simply integrate into the modular structure of the existing software.

On the extension side, the user will see no difference. The same digital telephone he or she uses today will access the ISDN

*(Continued page 20)*

Let's face it, for business to perform competitively in the thrust and parry of tomorrow's markets it will have to meet those challenges today.

There's no doubt that those with the vision to predict trends, anticipate change and recognise better ways of doing things first, are often the most successful in business.

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ISDN tariffs have not yet been determined by Telecom, but the commission has released preliminary charges to ease users' planning. The "real" cost of ISDN will be determined before the end of this year.

Tariffs for ISDN will be made up of

- an annual access charge for network users plus service subscription charges (Telecom will also charge once-only installation and service modification fees.)
- call charges
- dedicated line charges.

The charges envisaged are as follows:

## Tentative tariffs

| | | |
|---|---|---|
| **1) Annual access charge** *(including standard service subscription)* | | |
| first 20 channels | | $A6050 |
| each further 10 channels | | $A2200 |
| **2) Call charges:** | | |
| Telephony: | | Similar to present STD, but there will be a flagfall charge. Timed unit charges will be lower than present STD charges. |
| Modem pool access: | | 10 per cent above telephony charges |
| Digital 64k-bit/sec: | | 30 per cent above telephony charge |
| Virtual call: | | A flagfall charge equal to 30 minutes of 64k-bit/sec charges PLUS a timed charge of 45 per cent of the 64k-bit/sec charges |
| Other calls: | | As other network charges such as Austpac |
| **3) Dedicated line charges per year on bandwith (n x 64K-bit/sec) between two sites, for example:** | | |
| Sydney-Melbourne | (64kb/s) | $A 16,400 |
| " | (640kb/s) | $A 128,000 |
| " | (960kb/s) | $A 171,300 |
| " | (1280kb/s) | $A205,300 |
| Sydney-Perth | (64kb/s) | $A 22,500 |

**It may be interesting to compare Telecom's pricing with that envisaged by the French monopoly.**

**The French PTT, now about to begin installing ISDN in the Brittany region, expects to have spent 30,000 FF per connection by 1990, when the entire country is covered by ISDN. It will seek to recover its investment by charging: $360 per user connection, or $68 per PABX line connected, plus 60¢ per minute for local (less than 50km) calls, $1.75 per minute for long-distance calls, all with $2.45 minimum online charge per month.**

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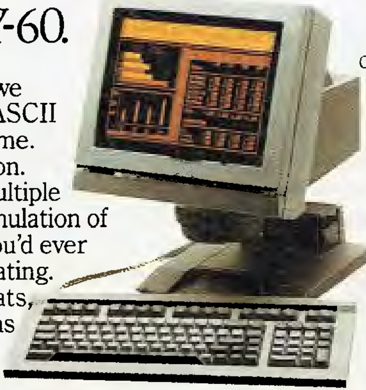
WYS 2892/M/R



# MS-Dos serves 100 Ascii terminals

NEWPORT BEACH, California — A private networking company here has introduced a multiple-microprocessor system designed to provide MS-Dos applications to as many as 100 Ascii terminals while letting them continue to function as terminals.

The Centaur II mainframe, unveiled by Data Voice Solutions, uses up to 100 NEC V40 application processors — compatible with Intel's 8-MHz 8086 — to provide terminal users with applications designed for the Microsoft operating system, such as Lotus 1-2-3.

Supporting most Ascii terminals through Novell's Netware operating system or through a private branch exchange (PABX), the product can also be linked to a variety of minicomputers and IBM mainframes. The system centralises microcomputer functions at the host level while retaining compatibility with MS-Dos, according to Jerry Kappenman, Data Voice's senior vice-president of product marketing.

### Host links retained

Centaur II essentially turns users' terminals into MS-Dos workstations while users retain connectivity to their host system.

"No one that we can see is bringing Dos to the 24 million terminals out there. That is a major market," Kappenman said.

Centaur II can contain between one and 100 applications processors, each of which is a "PC on a card". Terminals attached to the system use the applications processors to run MS-Dos programs. They can be wired directly to the processors on a one-to-one basis using standard telephone wiring, a data switch or voice/data PABXs to increase the number of terminals supported.

"Prices for the Centaur II mainframe, which is housed in a standard 19in rack, range from $US50,000 for a 30- to 40-user configuration to $US185,000 for a version that can support as many as 500 occasional users.

# Orion jumps on X.25 wagon

BERKELEY, California — Orion Network Systems, a leading US supplier of IBM connectivity software, has bought X.Dot Corp, gaining a line of software that uses the CCITT X.25 packet-switching protocol.

The acquisition is intended to round out Orion's line of connectivity products, which allow non-IBM computers to talk with IBM machines using standard SNA.

Orion currently sells its connectivity packages to companies such as Apple Computer, AT&T and Olivetti. In addition to gaining an immediate jump into the X.25 packet switching market, Orion will combine X.Dot's technology with its own SNA capability to make an integrated package that will feature both protocols.

The product, due out in 1988, would have a common user interface to help convert SNA data into X.25 packets

Many are upgrading and throwing out their existing computer system.

What a waste!

Phone Harris Lanier about Nina the network controller.

7542L

# User's guide to traps and benefits of ISDN

(Continued from page 18)

world through the PABX. Data terminals can be connected with the telephone on the one pair of wires. If the user has a requirement to connect special off-the-shelf ISDN terminals to the PABX, these can be connected to the 4-wire ISDN basic rate access bus that will be supported by the PABX.

### The user's view — services

The first user field trials of ISDN are planned for the middle of 1988. The services that will initially be available to the user are those which are particularly useful in PABX networking applications.

In the simplest case, the ISDN user will have full access to the public telephone network, using the same procedures as used today. When calls are made over the network, facilities such as calling number identification, private metering and malicious call trace are available at the user's telephone.

For data calls, bearer services such as transparent 64K-bit/sec channels and sub-64K-bit/sec channels using rate adaption are available.

The ISDN user has simple integrated access to a number of switched analogue and digital data services, including teletex at 2400 bit/sec and 64K-bit/sec rates, videotex at 1200/75 bit/sec and 64K-bit/sec rates and facsimile at Group 1, 2, 3 or 4 standards. Packet switching access will follow soon after.

Within the PABX or over a PABX network, the ISDN user has access to internal data resources such as PC communication, Lan communication, coax elimination (3270 protocol conversion) and host computer ports.

The system planner can use the ISDN facilities of his own PABXs and those of the network to instal invididual systems with access to the public ISDN, to establish private ISDN networks, and to give these private ISDN networks access to the public ISDN.

These network configurations can utilise direct ISDN tielines between PABXs; virtual tielines between PABXs using public ISDN network resources; semipermanent lines between PABXs through the public ISDN and simple circuit-switched connections through the public ISDN. To support these tieline connections and to achieve transparency of facilities between PABXs in a network, ISDN uses a special packet-mode signalling transfer service.

An important service in the initial release of ISDN is user-to-user message transfer. This can be used during the call setup stage or during the "conversation stage" of a call to pass proprietary messages in a transparent fashion end-to-end between users. There is a limit placed on the volume of information that can be sent by this method, but it does allow the user some method of adding value to his ISDN network.

A related end-to-end service is sub-addressing, whereby the user can directly address, for example, a terminal on a Lan that has a gateway connection on the called PABX.

The ISDN numbering plan will be integrated with the existing public switched telephone network (PSTN) numbering plan. ISDN national numbers will be a maximum of 9 digits, and in general it will not be possible to determine, from the number alone, whether a user is connected to the PSTN or the ISDN.

In the case of numbering for data calls in the ISDN, the ISDN is assigned a 4-digit Data Network Identification Code (DNIC) followed by an up to 9-digit terminal number (which will be the same as the telephone number). The DNIC allows any user on the Australian ISDN to be addressed from any international data network.

ISDN will provide a significantly enhanced quality of service to the user. The basic feature of end-to-end digital will give error-free and noise-free connections. In the case of voice calls, the speech quality will be almost perfect and the speech levels will be uniform. In the case of data calls, errors and re-transmissions will be eliminated.

The speed of establishing connections will be improved in ISDN. The powerful signalling channel used for call setup will eliminate long post-dialling delays for both voice and data calls.

The ISDN network will offer an inherently high standard of service availability to the user. The mesh-structure that characterises the ISDN and the flexibility of the common-channel signalling that links the nodes of the ISDN ensures that faulty links are effectively bypassed. In the early days of the ISDN, the high level of availability is strengthened by techniques such as dual access from a PABX to two separate ISDN nodes.

- *Peter Brown is assistant director, technology, with Ericsson Information Systems.*

# DEC bears down on small terminal makers

MAYNARD, Mass — Seeking to stave off competition in the Ansi text terminal market Digital Equipment Corp has introduced a smaller, improved terminal costing almost a third less than the popular VT220 model it replaced. The VT320 will be available in Australia late this year for about $A1250, according to DEC.

In the US, the sharp price reduction from $US795 for the VT220 to $US545 for the VT320 surprised observers, with an IDC analyst arguing that DEC was "making a statement with this price. Some of the smaller companies cannot react to this."

DEC claims to have manufactured more than one million VT220 terminals. In 1986, with 165,000 units shipped, it held a 42 per cent share of the Ansi text terminal market — twice that of runner-up Wyse Technology.

But IDC described the VT320 as a "catch-up product" because many vendors, such as Wyse, Hewlett-Packard and Televideo, are already selling terminals that offer a similar set of features. The VT320 includes a 14in anti-glare, flat-surfaced screen.

**The VT320 text terminal features new ergonomic design, optional "paper-white" phosphor and enhanced setup features compared with its predecessor, the VT220. The VT320 will be available in Australia late this year.**

# Godzilla's shadow falls on Ascii trade

*By James Connolly*

FRAMINGHAM, Mass — The symbolism has been used before. It pops up when IBM gets serious about a field in which dozens of smaller companies are running about with their own profitable, 10 per cent market shares. "Bambi meets Godzilla" rings crunchingly true again, just as it did a few years ago when it was used to illustrate IBM's impact on the then-blossoming microcomputer vendors.

This time, Godzilla's shadow is falling on the Ascii terminal makers, whose competition for market share has — compared with what is to come — been about as violent as yearlings going through their first rutting.

There was plenty of head-butting but minimal damage. Those vendors would undercut each other by a few dollars, and would claim to be a bit better than the big guys. But the big guys were companies such as Wyse Technology, which is roughly one 200th the size of IBM.

Then IBM included in its recent announcements an entry-level Ascii terminal priced at $US399, which is 42 per cent below its previous lowend price of $US695. That undercut many competitors' prices, and IBM added that the 3151 display station can be used only with IBM Ascii hosts such as the Series/1 and RT Personal Computer but with various other hosts through DEC and Wyse emulation cartridges. (DEC has since pulled VT230 pricing down with the release of the VT320, but is still $US100 above IBM.)

According to International Data Corp (IDC), IBM shipped 39,000 of the 1.27 million Ascii-type terminals sold in the US last year. The market leader was Wyse, which shipped 281,000 terminals.

IDC senior research analyst Diane Farrell called the Ascii market a slow growth area and said: "It's not likely that IBM can come in and grab a share of the market without hurting someone else." She described IBM's plans as a statement that IBM is getting tough.

IBM's move did not mean all Ascii terminal makers were about to be crushed. Companies such as Wyse should be able to respond. Even some of the smaller vendors may undercut or at least match IBM's price and claim functional superiority.

But pity the little vendor whose aim profit margins are about to be squeezed again, when IBM charges into a customer site with a competitive price and the backing of a $US51 billion company.

What the customer should hope for its that enough alternative suppliers survive to keep the market competitive. But they should be wary of the first vendor to come calling with the statement: "IBM's presence legitimises our market."

That has been said before, usually by vendors who would not be around to service their product because Godzilla was behind them.

# $US90 million airline order

SAN FRANCISCO — Startup company Teletix has handed Hewlett-Packard a $US90 million order to assemble and support some 10,500 ATM-like terminals for a vast airline ticket distribution network.

Teletix plans to instal ticketing terminals in offices, hotel lobbies and convention centres around the U.S. It will also target travel agents that mainly serve business travellers.

The Teletix network is designed to help it pull corporate travel contracts away from rivals. Teletix vice-president Arch Meredith said use of the network could, in effect, create branch offices nationwide for small agencies. It could also enable large agencies with many offices to reduce overhead by closing some of their branches.

Teletix will charge transaction fees for its services. The advantage to travellers, the network's endusers, will be 10-minute ticket and boarding pass delivery and reservation changes while on the road.

Teletix agency customers would make reservations through their present system, typically either American Airlines's Sabre network or United's Apollo network.

Teletix will tap the mainframes at the heart of these reservation networks and transmit the ticket data to the appropriate remote terminal. The ticket terminals themselves, to be called Ticketellers, will be based on HP personal computers, with attached printers for tickets, boarding passes and itineraries.

The terminals will also have a credit card reader, a vault for blank tickets and a touch screen for commands similar to those of automated teller machines. Like ATMs the machines will be designed to resist vandalism.

The deal with minicomputer maker HP provides for the assembly of 2500 Ticketellers in the first year with a value of $US20 million and a total of 10,500 machines at the end of three years.

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# PRODUCT UPDATE ON

TERMINAL turmoil is upon us: IBM has rediscovered the Ascii market and everyone else from DEC to H-P is scrambling for a piece of the action. In the process, small players risk getting squeezed out of the picture. In turn, terminal specialists such as Wyse — which hopes to capture a quarter of the local market — continue to diversify into the PC arena. The diagrams on Page 1 show a snapshot of last year's market. It will be interesting to see those "pies" a few months from now.

| Badge | Model | Emulate | N-V Ram | Display Ram | Interface | Control | Modes | Format | Speed | Buffer | Aux port | Screen | Refresh | Display |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BEEHIVE (Datatel)** | ATL004 | PT45/NCR 101, 301, 401/VT52/100 | 2K | 10K | RS2/422/20 | DTR/X/RTS | fh, blk, ch, loc, man | dps | 19.2 | 2K | as main | 14G | 50/60 | 1s/e |
| | ATL008 | VT100/programmable | 2K | 128K | RS2/422/20 | DTR/X/RTS | fh, blk, ch, loc, man | dps | 19.2 | 2K | as main | 14G | 50/60 | 1s/e |
| | ATL083E | ET+IBM | 64K | 36K | RS2/TD1 | ET | Synch/Asynch | dps | 19.2 | 2K | buff | 14G | 50/60 | 1s/e |
| | ATL078 | IBM 3270 | — | 2K | RS2/422/20 | IBM | fh, ch, loc, man | dps | 19.2 | | RS2, buff | 14G | 50/60 | 1s/e |
| | ATL180 | IBM 3180 | 64K | 48K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14g/a | 90 | 1s/e |
| | ATL180C | IBM 3180 | 64K | 48K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | rgb | 90 | 1s/e |
| | ATL191D | IBM 3270 Enhanced | 16K | 32K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14g | 52 | 1s/e |
| | ATL191E | IBM 3270 Enhanced | 16K | 32K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14a | 52 | 1s/e |
| | ATL191P | IBM 3270 Enhanced | 16K | 32K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14W Enh. | 52 | 1s/e |
| | ATL192D | IBM 3192F Enhanced | 64K | 48K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14g/a | 67 | 1s/e |
| | ATL192C | IBM 3192F Enhanced | 64K | 48K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14rgb | 67 | 1s/e |
| | ATL192F | IBM 3192F Enhanced | 64K | 48K | Coax "A" | IBM | IBM | x | 2.3Mhz | 2.8K | pp, buff | 14rgb | 52 | 1s/e |
| | ATL191DR | IBM 3192 + 3270 Series | 64K | 48K | Coax "A", EBCDIC | IBM | IBM | x | 2.3Mhz | 2.8K | RS2, pp | 14g/a | 67 | 1s/e |
| | ATL192DR | IBM 3192 + 3270 Series | 64K | 48K | Coax "A", EBCDIC | IBM | IBM | x | 2.3Mhz | 2.8K | RS2, pp | 14g/a | 67 | 1s/e |
| | ATL192FR | IBM 3192 + 3270 Series | 64K | 48K | Coax "A", EBCDIC | IBM | IBM | x | 2.3Mhz | 2.8K | RS2, pp | 14rgb | 67 | 1s/e |
| | ATL3270RS | IBM 3270 Series | 8K | 24K | EBCDIC | IBM | IBM | x | 19.2 | 2.8K | RS2, buff | 14g/a | 60 | 1s/e |
| | ATL3270MS | IBM 3270 Series | 8K | 24K | EBCDIC, multiport | IBM | IBM | x | 19.2 | 2.8K | RS2, buff | 14g/a | 60 | 1s/e |
| **C-ITOH (TCG)** | CIE 7801 | IBM 3278, 3178, 3191 | — | — | Memorex 2274, Telex 174/274, 3270/ 4/6; S/370, S/30xx, 43xx | — | | | — | — | RS232-C printer,<br>RS232-C comms | 14G | — | 15 |
| **CYBERNEX (Datatel)** | RB1100 | ET | 512 | opt | RS2, TD1 | ET | ET | ET | 38.4 | 7K | buff, sp | 14g/g | 65 | 2s, pg |
| | RB1100C | ET | 512 | opt | RS2, TD1 | ET | ET | ET | 38.4 | 7K | buff, sp | 14grb | 65 | 2s, pg |
| | RB1210 | ET | 512 | opt | RS2, TD1 | ET | ET | ET | 38.4 | 7K | buff, sp | 14g/a | 65 | 2s, pg |
| | RB1210C | ET | 512K | opt | RS2, TD1 | ET | ET | ET | 38.4 | 7K | buff, sp | 14grb | 65 | 2s, pg |
| | RH7814 | VIP 7814, 7804, 7801 | 512 | opt | RS2, 422, 20 | VIP | VIP | VIP | 19.2 | 4K | buff, RS2 | 14G | 65 | 2s/e |
| | RH7814C | VIP 7814, 7804, 7801 | 512 | opt | RS2, 422, 20 | VIP | VIP | VIP | 19.2 | 4K | buff, RS2 | 14G | 65 | 2s/e |
| | RH7813 | VIP 7813, 7823, 7803, 7801 | 512 | opt | RS2, 422, 20 | VIP | VIP | VIP | 19.2 | 4K | RS2 | 14G | 65 | 2s/e |
| | RH7305 | VIP 7305, 7315 | 512 | opt | RS2, 422, 20 | VIP | VIP | VIP | 19.2 | 4K | RS2 | 14G | 65 | 2s/e |
| **DEC** | VT220/330/340 | VT220, VT1/102, VT220, Tek | Yes | 6pg | RS2/423.20, 2 x RS423 | x | fd, mod | dps | 19.2 | 254 | Print RS232 | 14g/a | — | s/e |
| **DOMINO Var-specified** | DVT-227+ | VT2 | 256 | 4pg | RS2/422/20, | DTR/X | fh, loc, mod | dps | 19.2 | 256 | As main | 14g/a/w | 50, 60, 75 | 1s/e |
| | DVT-160 | VT100, WY50, TV ADM31, ADD | 256 | 4pg | RS2/422/20 | DTR, X | fh, blk | dps | 19.2 | 256 | As main | 14g/a/w | 50, 60, 75 | 1s/e |
| **HARRIS LANIER** | H178-02 | IBM3 | | | 32xx | | | | | | | 12g/a | | 1s/e |
| | H178-22 | IBM3 | | | 3274 | | | | | | | 12g/a | | 1s/e |
| | H179 | IBM3 | | | 32xx | | | | | | | 14rgb | | 1s/e |
| | H180 | IBM3 | | | 32xx | | | | | | | 14/15g/a | | s |
| | H181 | IBM3 | | | 3174/32xx, S/43 | | | | | | | 14rgb | | pg |
| **HONEYWELL BULL** | CDT-0350 | | | | | | | | | | | | | |
| | CDT-50 | ADDS, ADM, TV, WY, HAZ | — | — | RS2 | DTR/X | fh, blk, ch | dps | 38.4 | — | RS2 | 14g | — | 2s/e |
| | CDT-7310 | VT2, X, WY, ADDS, Haj | — | 7pgs | RS2 | DTR/X | fh, hd, blk | | 38.4 | — | buff, RS2 | 14g/a/wf | 60 | 2s/e |
| | CDT-7312 | WY, X | | | RS2 | DTR/X | fh, blk, ch | | 19.2 | | | 14g | 60 | |
| | VIP 9300 | VIP | | | RS2/422 | | Async | | 19.2 | | | 14g/a/wf | 60 | 25/o+ |
| | VIP 7800 | VIP | | | RS2/422 | | Sync/Async | | 19.2 | | buff | 12/14g | | |
| **IBM** | 3161 | IBM 3101, ADDS, Haz, ADM, TV | | | RS2/422 | x | | d | 19.2 | | RS2 | 12g | | 1s |
| | 3163 | 3101, DEC, YT1 | | | RS2, 42X | x | | | 19.2 | | | 12g/a | | 25 x 80 |
| | 3179 | | | | 3274/6/43xx | | | | | | | 14rgb | | s |
| | 3180 | | | | 3274/6/43xx | | | | | | | 15g | | s/e |
| | 3191 | | | | 3174/3274, 470X | | | | | | | 12, 14, g/a | | s |
| | 3192 | | | | | | | | | | | | | |
| | 3193 | | | | 3174/3274 | | | | | | | 15 mono | | s |
| | 3196 | | | | S/36, S/38, 5294 | | | | | | | 12g/a | | s |
| | 3197 | | | | | | | | | | | | | |
| | 3290 | | | | | | | | | | | 19 orange on black | | pg |
| **KIMTRON (Datatel)** | KT-5 | ADM, VT52, TV, HAZ, ADDS, + | 512 | 2/1pg | RS2 | DTR, X | fh, ch, blk | dps | 19.2 | 4K | RS2 | 14g/a | | 1s/e |
| | KT-70 | VT100, TV, DG, PT25, T1931+ | 512 | 1pg | RS2 | DTR, X | fh, ch, blk | dps | 19.2 | 4K | RS2 | 14g/a | | 1s |
| | KT-70/PC | VT100, TV, DG, PT125, IBM PC | 512 | 1pg | RS2 | DTR, X | fh, ch, blk | dps | 19.2 | 4K | RS2 | 14g/a | | 1s |
| | KT-22 | VT2, X | 512 | 3/2pg | RS2 | DTR, X | fd | dps | 19.2 | 4K | RS2 | 14g/a | | 1s/e |
| | KT-22/PC | VT2, X | 512 | 3/2pg | RS2 | DTR, X | fd | dps | 19.2 | 4K | RS2 | 14g/a | | 1s/e |
| | Satellite | IBM PC | — | 640K | RS2, K-net | IBM PC | fh, ch, blk | dps | 1Mhz | 2K | RS2, pp | 12g/a, 13rgb | | 1s/e |
| **OLIVETTI** | WS225 | NY50, Televideo 925, 910, Lear Siegler, ADM3A, ADMS, ADDS Vietpoint, A1, A2, 60 | 320 | 2pg | RS232C | DTR/X | fd, hd, loc, char, mom | dps | 38.4 | | RS232C | 14g/a | 60 | 1s/e |
| | WS220 | DEC VT220, VT100, VT52-user select | 400 | 2pg | RS232C/RS423 | DTR/X | fd, hd, loc, char, mom | dps | 38.4 | | RS2/RS423 | 14g/a | 60 | 1s/e |
| | WS280 | Ascii, Ansi and PC term | 400 | 6pg | RS2 | DTR/X | fd, hd, loc, char, mom | dps | 38.4 | | RS2, PP Centronics | 14g/a/w | 60 | 1s/e |
| **REBUS 14" (CVA)** | GDT-6160 A | TV, DEC, WY, HAZ, ADDS, ADM | Bk | 16K x 16 bits, 4pg | RS232C, RS422, 20 mali | — | fd, hd, duplex, blk, lt | 7/8 dps | 19.2/38.4 | — | Asynch, Bi-dir | 14g/a/pw | 50, 60, 75 | |
| **TATUNG 14" (CVA)** | 7261A | TV, LSI, ADDS, Haz, IBM, WY, DEC | — | 4pg | RS232C/RS422, 20 mali | — | blk, lt | 26 x 80/132 | 19.2/38.4 | — | | 14g/a | 50, 60 | |
| **TECO (TCG)** | VA220 | DEC VT52, VT100, VT200 | Yes | — | RS2 | | — | | — | — | RS232C | 14g | — | |
| | VA3178 | IBM 3278, 3178, 3191 | — | — | IBM 3270, 3274/6, S/370, S/30xx 43xx | | | — | — | — | — | 14g | — | 1s |

**Emulation:** *ADD = ADDS Viewpoint and Regent; ADM = Lear Siegler; Amp = Ampex; Bee = Beehive; DG = usually DG200/210; Esp = Esprit (usually 6310); ET = Burroughs; Free = Freedom (Liberty); Hars = Harris; Haz = Hazeltine (usually 1400/10, 1500); HP = Hewlet-Packard; ICL = ICL CO1/3; InC = Intercolor; InT = Intertechnique; nat = native mode; PC = IBM PC; Perk = Perkin-Elmer, Rex = Rexon; Strat = Stratus; tek = tekronix; TTY = teletype; TV = Televideo; VT1 = VT100 52; VT2 = VT100/52/220; Vac = Univac; video = videotex capability; VIP = Honeywell; WY = Wyse WY-50/50+; X = ANSI X3.64.* **Displays Ram** *(number of bytes or pages of display memory).* **Interface** *(serial interface standard or operating environment); RS2 = RS232C or V.24; /42x = additional RS422 or 423; 20 = 20mA current loop; 3270 = IBM 3270 environments; 32xx = IBM 3274/76 controllers; s/a = sync/async protocols; S/43 = IBM S/43xx display/printer adapter; twin = twinax:IBM S/38 environment; opt = wide range of options.* **Control** *(hardware or software hand-shaking): DTR = Data Terminal Ready; X = X-on/X-off; RTS = Request To Send.* **Modes** *(available communications modes; local echo is assumed; local mode is off-line); fd = full duplex; hd = half duplex; fh = full and half duplex; loc = local mode; ch/char = character/conversational mode; bi = block transfer; line or page modes; mod = modem control; mom = monitor mode (displays control characters).* **Format** *(serial data format variables); d = data word length; s = number of stop bit; p = parity.* **Speed** *(Maximum available data transfer rate in K-bits/sec; s = split data rates supported (eg. 1200/75).* **Buffer** *(communications buffer memory size in bytes).* **Auxiliary port** *(auxiliary port facilities, in general, same as main interface); sp = serial printer port; pp = parallel printer port; buff = buffered.* **Screen:** *xx = diagonal size in inches; g = green; a = amber optional; w = paper white optional; rgb = color; f = flat; mono = monochrome; LCD = Liquid Crystal Display.* **Refresh** *(maximum available screen refresh rate in Hertz).* **Display:** *s = standard (24 lines x 80 characters — preceding number give status lines, + indicating extra lines); /e = optional expanded (x 132 characters); xx = number of lines where not standard; pg = variable page length autopaging or multiple display formats other than the types mentioned.* **Matrix** (character pixel matrix on cell size — description uses alphanumeric code; a=10 to k=19, excluding 1): 89:ab=8 x 9 character on 10 x 11 cell; figures after slash / denote matrix sizes in 132 column mode. **Character** *sets (available character sets, UK assumed: EBCDIC = Expanded Binary Coded Decimal Interchange Code (256 characters); prog = programmable (down-loaded) character set;*

# TERMINALS

Meanwhile we offer you a detailed look at a selection of terminals in this month's **Datafile**. *Note that for space reasons, only part of the product offering can be shown this month. The remainder will be published in next month's* Communications World.

The chart was compiled on the basis of information provided by the terminal suppliers. All care was taken in assembling the chart, but intending purchasers should check out all details with prospective vendors.

| Matrix | Char. set | Language | Attributes | Cursor | Scroll | Keyboard | Function | Key pads | Special | Price $ (excl. sale tax) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 79:9d | Ascii, sg, bg, nat | 10 | full | bubb | slj | 94, vt | 8/16p | 14Np, C | CRT, post | 1644 | Full features, programmable from keyboard |
| 79:9d | Ascii, sg, bg, nat | 10 | full | bubb | slj, spt | 94, vt | 8/16p | 14Np, C | 255 f keys | 2607 | 16 bit cpu, programmable from keyboard |
| 79:9d | Ascii, SG, bg, nat | 5 | full | bubb | spt | 110, vt | 16p | 14Np, Burroughs | n vans | 2306 | Both Burroughs and other host cpu |
| 79:9d | Ascii, EBCDIC, sg | int | IBM | IBM | jmp | 87,3278 | PF, NV | 12Np, dual function | graf | 1598 | IBM 3278 style terminal |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3180 | 24, NV, PF | 18Np, C, E, Com | CRT, Dyn focus | 2224 | Menu driven configuration control |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3180 | 24, NV, PF | 18Np, C, E, Com | CRT, Dyn focus | 3058 | Menu driven configuration control |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3270 | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 1593 | Menu driven configuration control |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3270 | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 1593 | Menu driven configuration control |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3270 | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 1883 | Menu driven configuration control |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3192 | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 2115 | TCM, 4 screen modes |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3192 | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 2346 | TCM, color, 2 screen modes |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, 3192 | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 2567 | TCM, color, 4 screen modes |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, IBM | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 2543 | Equals ATL191D + ATL3270RS |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, IBM | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 3018 | Equals ATL192D + ATL3270RS |
| 86:cg | EBCDIC | int | IBM | IBM | jmp | 122, IBM | 24, NV, PF, PA | 18Np, C, E, Com | CRT, Dyn focus | 3296 | Equals ATL192F + ATL3270RS |
| 79:9d | EBCDIC, | int | IBM | IBM | jmp | C2, 3, 4, IBM | 24, PF, PA | 12Np, C, E, Com | CRT, Dyn focus | 3232 | TCM, remote multi session |
| 79:9d | EBCDIC, | int | IBM | IBM | jmp | C2, 3, 4, IBM | 24, PF, PA | 12Np, C, E, Com | CRT, Dyn focus | 4111 | TCM, remote multi session |
| 79:9k | EBCDIC | — | Part | bubb | — | 87 | 24, PF |  |  | 1400 | VDU small footprint 30.4cm x 30.4cm, standard 3270 environment display in 4 modes |
| 79:9d | Ascii, ET | int | ET |  | s/j | 102, ET | 10/20/s | Np, E, Cp, Com | CRT | 2150 | Enhanced ET compatible |
| 79:9d | Ascii, ET | int | ET |  | s/j | 102, ET | 10/20/s | Np, E, Cp, Com | CRT | 3699 | 4 Concurrent host sessions with 5th for print |
| 79:9d | Ascii, ET | int | ET |  | jmp | 109, ET | 10/20/s | Np, E, Cp, Com | CRT | 2150 | 4 Concurrent host sessions with 5th for print |
| 79:9d | Ascii, ET | int | ET |  | jmp | 109, ET | 10/20/s | Np, E, Cp, Com | CRT | 3699 | 4 Concurrent host sessions with 5th for print |
| 79:9d | Ascii, VIP | int | VIP |  | jmp | 108, din | 10p, 24pf | 14Np, E, C, Com | 72 line | 2532 | Enhanced VIP compatible |
| 79:9d | Ascii, VIP | int | VIP |  | jmp | 108, din | 10p, 24pf | 14Np, E, C, Com | 72 line | 4081 | Enhanced VIP compatible |
| 79:9d | Ascii, VIP | int | VIP | bubb | jmp | 113, din | 10p, 24pf | 20Np, E, C | 72 line | 2695 | Enhanced VIP compatible |
| 79:9d | Ascii, VIP | int | VIP | bubb | jmp | 113, din | 10p, 24pf | 20Np, E, C | non glare | 2066 | Enhanced VIP compatible |
| 79AA | Ascii, dsg, prog | — | Part, DBL | — | SPT | 105 VT DEC MVTE | 25 + 15p | Yes | CRT | — | The standard replaces VT240 supports 2 concurrent sessions. Color version of VT330 |
| 7d:af/6d:7f | Ascii, 2 exp | II | Full, DBL | bubb | 5j, 45, spt | 105 VT | 20/15 nv, 4pf | N, E, C | CRT, graph, nvans | 799 | Enhanced VT220, full 8 bit plus Tek4010/14 upgrade |
| 7d:af/6d:7f | Ascii, 2 exp | II | Full, DBL | bubb | 5j, 45, spt | 115 Anscii | 20/15 nv, 4pf | N, E, C | CRT, graph, nvans | Var | 14 emul with enhancements plus Tek4010/14 upgrade |
| 9e |  |  |  |  |  | 92 |  |  |  |  | IBM 3178 alternative, 3270 plug-compatible |
| 9e |  |  |  |  |  | 122p | 24 |  |  |  | Attaches to 3274 controller |
| 9e |  |  |  |  |  | 122 | p |  |  |  | 3270 plug-compatible, 7-color terminal, APL support |
|  |  |  |  |  |  |  | p |  |  |  | 3270 plug-compatible, APL/TEXT support |
|  |  |  |  |  |  | 122 | p |  |  |  | 3270 plug-compatibles runs without network modification |
|  |  |  |  |  |  |  |  |  |  |  | Color version of CDT-50 |
| 7d:ad/7d/9d | 128A | — | Full | bubb |  | 101 | 16/32p | 16 NC |  | 1070 | Suit Pick/Unix systems |
| 712ah | — |  | Full | bubb | US, SPT | ANSCII | p | NC | CRT | 1350 | Suit Pick/Unix systems |
|  |  |  | Full | bubb | vs | ANSCII | p | NC |  | 1000 | Suit Pick/Unix systems |
|  |  |  |  | bubb | vs | VIP | 12p | NC | CRT | 1530 | Honeywell system terminal |
|  |  |  |  | bubb | s/j | VIP | 12p | NC |  | 2500 | Honeywell system terminal |
| 8g | ACII. 1g |  | bubbr |  | spt | Ascii | 12/24.3PA | N | CRT |  | IBM standard Ascii terminal, also av. with different emulations |
|  | ASCII |  | full |  | s/j, spt | 102 | 12-24PF, 3PA |  |  | 2195-2340 | Also av. with different emulations |
|  |  |  |  | bub | s/j | 102, 122, 124 | 24PF |  |  |  | Color display for 3270/ Sys36/38 environments |
|  |  |  |  | bub | s/j | 122 | 24PF |  |  |  | Model 1 for 3270 controllers: Model 2 for Sys36/38 |
|  |  |  |  | bub | s/j | 102, 104, 122, APL | 24PF |  |  | 2201 |  |
|  |  |  |  |  |  |  |  |  | 3903-5741 |  |  |
|  |  |  |  |  |  | 122, 102 |  |  |  | 5313 |  |
|  |  |  |  |  |  |  |  |  |  | 2192-2202 |  |
|  |  |  |  |  |  |  |  |  |  | 3648-3982 |  |
|  |  |  |  |  |  | 102, 122 |  |  |  | 6577-14258 |  |
| 79:ac/5a:6c | 128 Ascii | int | full, sec | bubb | jmp | ANSCII | 84p | NC | CRT | 760 | Programmable features |
| 79:9d | 128A Sg, sgm, lg | int | full, n/b, sec | bubb | jmp | ANSCII | 84p | NC | CRT | 875 | Programmable by Datatel |
| 79:9d | 128A, IBM PC | IBM PC | full, n/b, sec | bubb | jmp | IBM PC | 84p | NC | CRT | 919 | Behaves like IBM PC |
| 7a:aa/7a:9a | Ascii, prog, sg | int | full | bubb | s/j | VT | 13/30 pnv | NCE | CRT | 889 | Enhanced DEC emulator |
| 7a:aa/7a:9a | Ascii, prog, sg | IBM PC | full | bubb | s/j | IBM PC + | 15/30pnv | NCE | CRT | 962 | Enhanced IBM PC compatible VDU |
| 7g:9d | IBM PC | IBM PC | IBM PC | bubb | s/j | IBM PC | 15p | NpCE | CRT | 1224 | Network IBM PC compatible |
| 8 x 13 | 256 Ascii | int opt | full sec | bub | s/j, VS | Ascii qwerty | 16/32/pnv, 4/8 pc | Np, E C | CRT |  | Ascii terminal capable of interfacing with variety of computer systems |
| 8 x 13 | 128 A. Sg |  | full sec non | bub | s/j, VS | VT | 38pnv | Np | CRT |  | ANSI/DEC VT220 compatible |
| 8 x 13 | 256 IBM, 512 prog | 12 | full sec b/non | bub | s/j, VS | Ascii, PC/AT, RT/PC | 32pnv | Np | CRT |  | Two host sessions, 3 in 1 terminal, PC parallel printer port, choice of 3 keyboards |
| 7 x 13 | 95 Asch, 37 EC, 32 DECG 32 WYG | int | p/up (Ascii) | bub | VS | 111, 115 | 46p | E/N/F (3) | CRT |  | 4010/4014 option |
| 7 x 13 | 128 Ascii, 46 EC, 48 SG | int | p/up (Ascii) | bub |  | Ascii 102, prog | 24p | — | CRT | — | — |
| 7 x 9 | Ascii | — | part | bubb | smt/jmp | 105 | 36pf |  |  | 1400 | Many more advantageous options than VT220 |
| 79:9k | Ascii | — | part | bubb | — | 88 | 24pf |  |  | 1400 | VA3178 has volume control for the audible alarm |

*2xp = programmable sets; figure alone denotes numbers of displayable characters; xxxA = ASCII, including control codes unless stated; Dsg = Dec special or supplementary graphics; sg = special graphics; bg = block graphics; lg = line graphics nat = national character symbols; sym = special symbols; NR = national replacement character set; alt = alternate character set; DNR = Dec national replacement character set; sup = supplemental;* **Languages** *(number of international character sets available): Dec = Dec multinational character set; int = international character sets; opt = preselectable set.* **Attributes** *(special display attributes): full = bold, blink, blank, underline, reverse; part = no blank; min = up to 4; strike = strike-through; sec = secure/protocol; col = color; non = non-embedded; n/b = embedded or non-embedded; cond = condensed characters; script = sub or superscript; dbl = double height/width; ital = italic; under = underline.* **Cursor** *(attributes): bubb = block, underline, blink, blank; bub = block, underline, blink or blank; bubr = block, underline, blink, reverse; bbb = block, blank, blink.* **Scroll** *(scroll control models): smt = smooth; jmp = jump/pages; s/j = jump or smooth; vS = variable speeds for number); spt = split screen, scroll regions or windows.* **Keyboard** *(preferred keyboard layout style — does not imply compatibility): total number of keys; vt = Dec VT220 or IBM PC AT )cruciform or inverted T cursor pad, separate numeric pad and function keys); VIP =Honeywell VIP; int = integral (non-detached) keyboard; VT1 = Dec VT100; 3278 = IBM 3278; opt = range of styles available; ANSCII = ASCII/ANSI; IBM/Dec = IBM and Dec functions; lo-pro = low profile; qwerty = typewriter style.* **Function keys** *(number and programmability): number of function keys with shift and control; p = programmable; nv = programmable to non-volatile memory; PF = keys with program function; PA = keys with program access.* **Key pads** *(keypad function, proceding number gives number of keys, other abbreviations as for function keys column): N = numeric keypad; E = specific editing keypad; C = cursor keypad; Com = terminal command keypad.* **Special** *(special features): rtc = real-time clock; dtu = desktop utilities; CRT = CRT saver; help = help windows; PCup = upgrade to PC workstation available; Word = Wordstar command sequences; post = power on self test; diag = diagnostics; graph = graphics mode; calc = calculator mode; pans = programmable answer back; nvans = non-volatile programmable answer back; add = terminal has two addresses, printer has third address; buff = keyboard buffer.* **Price** *(one-off, enduser prices where applicable).*

# Networks giant goes into Spain

PARIS — In a continuing effort to expand its presence in Europe, Electronic Data Systems (EDS), the world's largest software and services company, is moving into the Spanish value-added network (Van) market. The General Motors subsidiary has signed a joint-venture agreement with Spain's state-controlled telecommunications group Cia, Telefonica Nacional de Espana SA to develop and sell packet data networks to the public and private sectors, using technology developed by Telefonica for its Tesys packet switching system. The new services will be marketed by EDS.

EDS will own 51 per cent of the new venture, with Telefonica holding the remaining shares. Total capitalisation was not revealed. EDS has been eagerly attempting to penetrate the European market, where the easing of PTT restrictions is opening up vast markets for corporate communications specialists.

Specialising primarily in systems integration and facilities management projects, EDS has a huge international telecommunications network that links 40,000 user terminals with 200 CPUs over several continents.

# DEC expo underlines commitment to OSI

*By Paul Korzeniowski*

BOSTON — At a sprawling exposition designed to impress its largest customers, Digital Equipment Corp sounded the networking theme, introducing a new generation of its Digital Network Architecture and a variety of communications products. Also announced at Decworld '87 — spread out over seven Boston hotels, a conference centre and two ocean liners, including the Queen Elizabeth II — was Ethernet support over twisted-pair wire.

The exposition was being used to reaffirm DEC's earlier commitment to support the International Standards Organisation's Open System Interconnect (OSI) model. DEC also strengthened the links between Decnet and IBM products and added important networking features users need to instal corporation-wide networks that many competitive products lack.

Gartner Group analyst Vince Barrett said, "(Systems Network Architecture) is the de facto enterprise networking standard, and it would be difficult for any other model to displace it. By raising the OSI flag and providing exceptional IBM connectivity, DEC is presenting a convincing case for companies thinking about making Decnet their enterprise-wide networking standard."

The event was used to launch Phase V of the Digital Network Architecture, to be embodied in Decnet/OSI Phase V products. Decnet V will be "compatible with existing Decnet installations and, at the same time, will provide MIS managers with an easy transition to OSI standards," the company said.

The announcement affirmed a commitment to OSI the company first made in July 1985, when it promised to migrate its current proprietary network architecture to OSI.

Although no new products or services were introduced, the company said the fifth-generation architecture will, over time, provide Decnet users with full compliance with OSI. William Johnson, vice-president of distributed systems at DEC, said OSI conformance will take two or three years.

According to Kim Myhre, vice-president of communications research at International Data Corp, "Decnet Phase V is DEC's promise to make every attempt to incorporate OSI in Decnet where possible and appropriate. This counters IBM's commitment to provide gateways to OSI."

If fully realised, Decnet Phase V will position DEC with an attractive alternative to other network architectures. "Phase V will establish Decnet as the de jure OSI alternative to SNA for multivendor networking," said David Terrie, an independent consultant and editor of *Patricia Seybold's Network Monitor*.

The commitment does not mean that Decnet will be functionally equivalent to OSI. According to Barrett, DEC views OSI as a subset of Decnet. "OSI support will be more in terms of interfaces than implementations of a universal protocol stack that every vendor will use solely for its network model," Barrett said.

DEC President Ken Olsen depicted industry standards as stable platforms on which vendors can build to differentiate their products.

"Standards evolve slowly and require tedious work," Olsen said. "Most of the interesting work in the network area has been and will continue to be done with proprietary products."

Products announced at the show included an enhancement to Mailbus, an application program that links DEC's All-In-1 users with various electronic-mail systems, including IBM's SNA Distribution Services (Snads) and Distributed Office Support Services (Disoss).

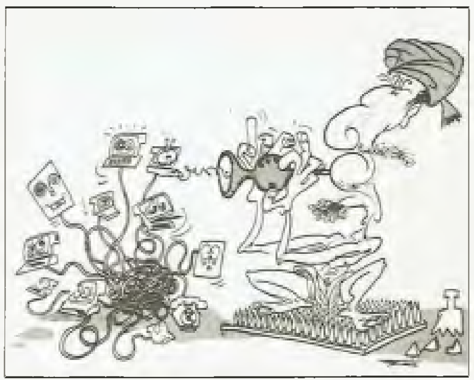
DEC also committed to adding gateways for Mailbus to Ultrix, its implementation of Unix, and to IBM's Professional Office System (Profs) e-mail system. Mailbus runs on a Vax or Microvax computer and requires Decnet software. The link to Disoss will be available in November.

DEC also unveiled three products that make it easier for users to access information on corporate Decnet networks. In order to access a file on many networks, a user has to know not only the name of a file but also the name of the machine on which the file is stored.

To help overcome that limitation, DEC introduced the Vax Distributed Name Service, communications software that ensures a consistent networkwide naming convention for network resources. Prices for the software range from $US600 to $US14,400.

DEC also released Vax Distributed File Service, communications software that enables users to access a file without knowing where it is stored. Prices for the software range from $US250 to $US3600.

The third product, Distributed Queuing Service, is meant to enable customers to send print requests to remote printers, view the status of a request and delete requests from a print queue. The product requires VMS operating system 4.4 and Decnet-Vax. Prices for Distributed Queuing Service range from $US250 to $US3000.



# Amdahl catches up at last

SUNNYVALE, California — Trailing years behind its chief rival IBM, Amdahl Corp has introduced its long-awaited IBM 3725-compatible frontend processor. Amdahl attributed the delay of its 4725-30 and 4725-40 to the design of a new chip set used to increase the performance over its existing 4705.

The new chips increase the 4725-40's throughput to and from host processors by 80 per cent, compared with the 4705 which it replaces, and 20 per cent for the 4725-30, said Tim Logan, Amdahl's director of communications products. The new chip set uses emitter coupled logic, the same chip design used in Amdahl's fastest mainframes. Logon said: "It took time to adopt this type of technology." Designed by Amdahl, the units will be manufactured by Fujitsu Ltd in Japan.

Analysts, who have been waiting for Amdahl to respond to IBM's introduction of the 3725 in 1984, said Amdahl's development efforts were further slowed by revisions to IBM's Network Control Program (NCP). In the past 18 months, IBM has released three new versions of NCP, the software that operates the frontend processors. Amdahl had to ensure the new models could run the latest versions.

The new frontends have 512K-bytes to 3M-bytes of main memory, and the base configuration of both models supports up to 128 full-duplex communications lines, expandable to 256. The units support up to six host links.

Both units support line speeds of up to 256K-bit/sec. Future 4725 models will support IBM's Token-Ring local network, a capability already offered on IBM's 3725. Pricing ranges from $US71,500 for the low-end Amdahl 4725-30 to $US545,160 for the 4725-40.

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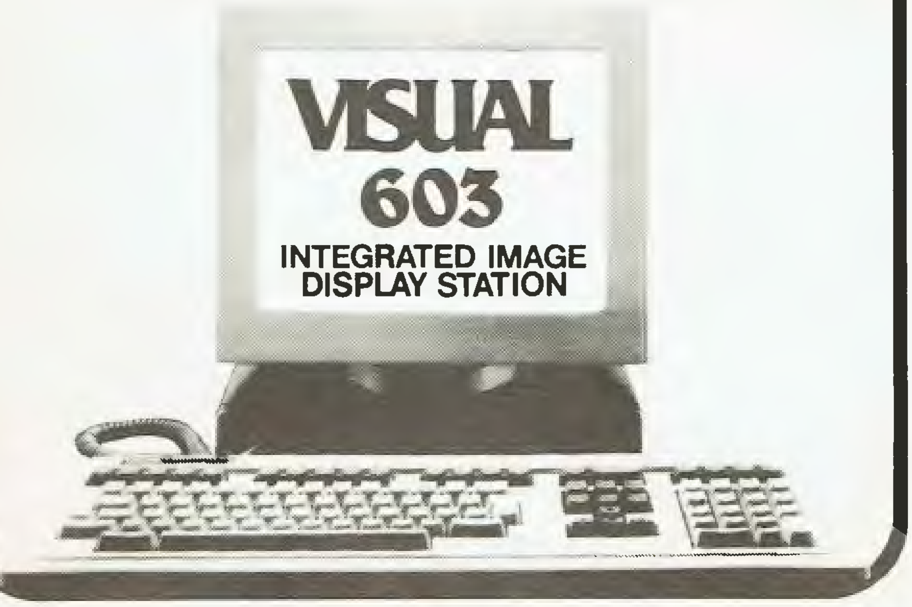


# 10th anniversary of Arcnet

*By Maggie Macrae*

ROME — Datapoint Corp, one of the pioneers of distributed processing and local area network (Lan) technologies, celebrated the 10th anniversary of the invention of its Lan package Arcnet in style recently at Arcnet '87 in Rome.

Arcnet'87 also marked the company's return to a more vocal and visible presence in the European vendor and user communities, and its decision to develop closer ties with the market and its users. Arcnet'87 has taken the form of a travelling roadshow and user conference.

The Rome kick-off and celebrations were highlighted by the attendance of key Datapoint personnel from the US and its international subsidiaries, and the comprehensive hands-on demonstrations of Starbuilder, Minx, Vista Office and, of course, Arcnet.

Starbuilder integrates multi-vendor personal computers into a single networked system and was launched last year. At Arcnet '87 it was set up in realtime mode and used to network various types of personal computers, including an IBM PS/2. PC-PC communications and the exchange of data and files within the network and with a minicomputer were demonstrated.

Minx, Datapoint's multi-media information network exchange, was also linked to the Starbuilder network. The transfer of audio, video, text and data was possible using the existing Starbuilder co-axial cabling. The growing list of Minx uses was shown.

Running on the Starbuilder network and on the Minx was Vista Office, Datapoint's office automation system, which recently won its third consecutive AITA (Australian Information Technology Association) award.

On hand to answer questions from the 50-strong contingent of international computer press and Datapoint users were Bob Potter, the company's newly appointed chief executive officer, Steve Baum, director of financial planning and treasurer, Larry Wickwar, vice-president of development, Ron Meyers, vice-president of marketing and sales and vice president Asia/Pacific, Jim Behan, vice-president, worldwide marketing, Gordon Cardigan, vice-president, communications; and the managing directors of Datapoint's 14 subsidiaries, including Kirby Herron, managing director in Australia and John Abbott, managing director in New Zealand.

In 1983, Arcnet passed a milestone — the 5000th Arcnet system was installed. At the end of 1986, this figure had risen to 8000, with 500,000 installed nodes.

According to Potter, Datapoint aims to become the industry's leading systems integrator and to support 90 per cent of all vendor hardware via Arcnet.

"The release of Starbuilder, last year, was the first move towards this goal," he said, "and the release now of Starprobe, an Arcnet network analysis system for data collection and recording; and Vista Gate, a communications server which offers concurrent support of multiple communications protocols over a single host communications link, is the second."

# Tradenet cuts costs of paperwork

SYDNEY — There is no market in Australia yet for electronic document interchange (EDI), according to one major player, who has high hopes of winning a lucrative contract in Singapore.

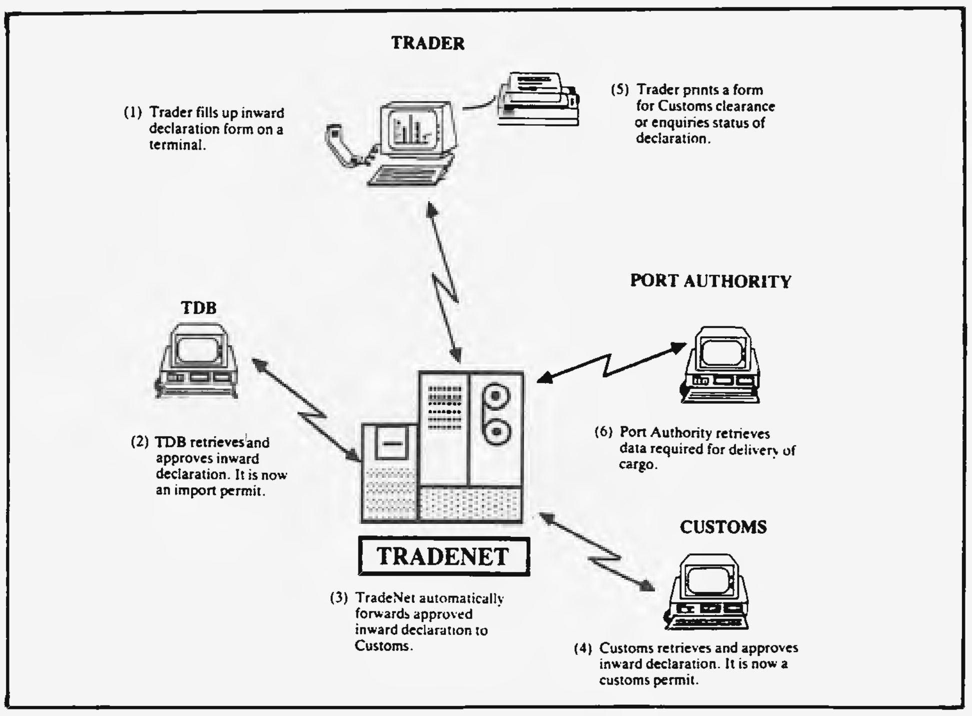
Called Tradenet, the planned network for the island State's trading community (see diagram) aims to reduce trading costs by eliminating expensive repetitive paperwork and speed up the movement of cargo via Singapore's busy port.

Tradenet is one of the strategic national information systems to be developed under The Singapore Information Technology plan, which aims to create competitive advantages for the manufacturing and trading sectors, particularly in the computer components industry.

Tradenet will function as an electronic clearing house; each trader's computer needs to establish only one link to the central computer to communicate with any other system on the network. Tradenet can also be used to access trade-related databases containing information such as prohibited goods lists, flight and shipping schedules and trade regulations.

The same network will link the Government's agencies to facilitate port operations, cargo clearance and compilation of statistics. The vamping up of Tradenet has been very thorough. Singapore's National Computer Board has spent 18 months analysing trade procedures and documentation, seeking to simplify and standardise.

The network specifications were also based on the findings of the Computer Board. Competitive bids for software and hardware from European, US and Japanese vendors are currently being evaluated.


TRADER
(1) Trader fills up inward declaration form on a terminal.
(5) Trader prints a form for Customs clearance or enquiries status of declaration.
TDB
(2) TDB retrieves and approves inward declaration. It is now an import permit.
PORT AUTHORITY
(6) Port Authority retrieves data required for delivery of cargo.
TRADENET
(3) TradeNet automatically forwards approved inward declaration to Customs.
CUSTOMS
(4) Customs retrieves and approves inward declaration. It is now a customs permit.

# IBM, Ericsson join forces

PARIS — IBM has woven its web over the European telecommunications equipment market a bit tighter with the announcement that it has launched a joint study with Sweden's L M Ericsson in the area of intelligent networking.

IBM Europe here said the two companies will seek ways of combining IBM expertise in database and data network management technology with Ericsson's AXE switching technology. (See also separate story on news page) The object of the study is to develop technical solutions — based on standard IBM and Ericsson systems and specialised IBM and Ericsson software — for the intelligent network concept.

The nonexclusive agreement provides for architecture definition activities between IBM systems and Ericsson switches, connectivity tests between IBM equipment and the AXE switches using standard interfaces, and product opportunity evaluation.

IBM has signalled its intention of becoming a major player in European telecommunications for some time, lending its support to moves toward deregulation and re-organising business units to meet the challenge.

In June, IBM announced the formation of a new organisation — Integrated Services Switching Systems (ISSS) — for developing and manufacturing voice and data-switching systems in Europe. One of the new unit's main tasks will be to adapt IBM's Rolm switching equipment to gain approval by Europe's powerful telecommunications authorities.

# 3Com to pay inventor royalties

SANTA CLARA, California — 3Com has agreed to pay royalties for the US and foreign patents for token-ring technology held by Willemijn Holding BV, the Netherlands-based company that holds token-ring patents granted to Swedish inventor Olof Soderblom and AT&T.

The licences will allow 3Com to produce, market and distribute token-ring products without restriction and apply retroactively to 3Com's existing product based on the IEEE 802.5 token-ring standard.

Under the agreement, for the life of the patents, 3Com will pay Willemijn an undisclosed royalty for all token-ring products bought by 3Com customers.

Soderblom's patent is effective until 1998. The AT&T patents — which Soderblom bought earlier this year to end confusion in the industry about who should pay whom — expire next year.

Some 25 other companies, including Ungermann-Bass, NCR, Hitachi, Fujitsu and IB have reached agreements with Willemijn, which is still seeking royalties from other vendors using the token-ring concept in their networking hardware, including Prime Computer and Apollo.

## Industry outlook

**MELBOURNE — Telecom has opened a network management centre intended to monitor critical performance indicators of at least 1000 million telephone calls on 15,000 routes a year. It will supervise some 1600 planned outages of major transmission bearers in an average year, co-ordinate 200 bearer restorations and do some 9000 quality assurance checks designed to pinpoint possible faults before they start to affect customers.**

**SYDNEY — Bankstown City Council has bought Australia's first French-made Honeywell Bull DPS 7000 computer to replace an aging Level 64 and enable the council to enhance its bureau services to other councils. The $A2 million system includes twin Datanet 8 frontend communications processors and provides for integration with existing micros and peer-to-peer networks. The council itself will use 100 Honeywell Bull PCs, half of them with attached printers.**

**MELBOURNE — Datacraft is to share show space with Telecom Australia at the Geneva Telecom 87 exhibition later this month, exhibiting a range of modems including its new X.25 Packetlink modem. Managing director Peter Pryor said he was confident the show would provide further export opportunities following Datacraft's recent multi-million dollar contract to upgrade the digital network in Hong Kong.**

**SYDNEY — Heyden-Spike is tipping a boom in sending data to mobile installations via radio. It has formed a data division following the aquisition of mobile data software specialists Detente Systems and expects revenue from mobile data markets will rise to half of its total revenue. The company has already installed a $A750,000 system for the Royal Automobile Association of SA.**

**BRISBANE — Gold Coast-based encryption specialist Eracom has announced annual sales of more than $A5 million, an increase of 286 per cent over 1985/86. Australian sales doubled to $A2.3 million while exports rose more than 500 per cent to $A2.8 million. Chairman Bruce Small paid tribute to Eracom's agents in Hong Kong, Singapore, Malaysia and Thailand, and in particular its West German affiliate Concord-Eracom, for the export result, which he said proved wrong all government ministers who claim "Australians can only export software not hardware".**

**SYDNEY — Scitec Communication Systems has been awarded a $A100,000 export incentives grant to boost international sales of its locally designed Maxima switch. The grant was given by Austrade under the High Technology Exporters' Scheme. Managing director Moshe Yerushalmy said Scitec is expecting export orders worth more than $A5 million over the next 12 months "with the Maxima product range leading our drive into the European markets".**

**MELBOURNE — Ericsson Australia recently cut over its first financial dealer system, the FDS-10, in the highly competitive Japanese market. The system, consisting of a non-blocking digital switch and 24 consoles with 135 lines, was designed and manufactured entirely in Australia. It was installed by the Credit Suisse subsidiary in Tokyo in what is considered a major coup in the world's second-largest telecommunications market. Dealers can call up to eight different pages, each of 60 line names, and display all calls-in-progress. Ericsson also appointed a local distributor, Kanematsu-Gosho Ltd, for the FDS-10.**

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SD

# Twisted pair development called 'truly magnificent'

BOSTON — After more than a year of codevelopment, Digital Equipment Corp and 3Com Corp have announced products that support Ethernet using nonshielded twisted-pair telephone-type wire.

Executives from both companies recommended use of twisted-pair wire to augment other types of wire, including coaxial cable, rather than replace them. DEC is continuing to encourage customers to use Thinwire Ethernet for new construction because it believes the cable is most reliable and cost-effective.

"Coax is so much easier, but a number of our customers put twisted pair in their buildings and they're too embarrassed to take it out, so we've adopted Ethernet on twisted pair," joked DEC President Ken Olsen during the company's announcement at Decworld '87.

"It's a truly magnificent technical achievement, but that doesn't mean it's the best choice," Olsen added. "Twisted pair costs more, it's awkward, and it has limitations. But for those people who need it, it's exceedingly important. And if you're committed to it, we have the answer."

Although the companies worked together and have cross-licensed each other's technology, DEC and 3Com have come up with slightly different products. DEC's Unshielded Twisted-Pair Ethernet Adapter (Utpea) is a pair of adapters that can be used with most installed telephone wire. One is used to connect a workstation to the twisted-pair wire, and the other is required at the far end of the wire in the wiring closet. Twisted-pair cable runs can be up to 50m to 70m.

In the wiring closet, the adapter provides a coaxial cable output for attachment to a DEC Ethernet multiport repeater, an existing product that provides a connection to a coaxial Ethernet backbone.

3Com's system consists of two components, the Pairtamer adapter and a repeater called Multiconnect. The product line also includes Lanscanner, a tool for assessing the suitability of installed wiring for Ethernet transmission.

Thin coaxial cable coming out of an Ethernet workstation is used to connect to the Pairtamer, which in turn is tied to one pair of unused twisted-pair wires in a typical telephone wiring bundle. A second Pairtamer is placed in front of the Multi-Connect repeater, which will typically be located in a remote wiring closet.

Multiconnect repeaters are used to connect wiring centres or to tie a cluster of users to an Ethernet backbone. One repeater contains slots for 15 modules and supports any combination of coaxial, fibre-optic and twisted-pair wiring.

3Com is supplying two types of modules, a thin coaxial cable connection for $US230 and a thick coaxial cable connection, priced at $US175.

Users can instal up to 45 modules by adding two Multiconnect expansion units. Each Multiconnect expansion unit is $US1095. The Pairtamer set is priced at $US325.

Maximum cable runs vary in the 3Com scheme because of the use of coaxial cable to run from the Pairtamer to the workstation.

DEC expects to begin delivery of its adapter in January 1988. 3Com's products will be available this December through specially authorised US-based resellers. 3Com also said it had an Ethernet adapter for the Micro Channel and 80386-based diskless workstations in the works.

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DEALER ENQUIRIES WELCOME

# Channel bypasses processors

*By Mary Petrosky*

CUPERTINO, California — Tandem Computers has introduced a channel attachment unit, Snaxlink, that links Tandem minicomputers directly to IBM and IBM-compatible mainframe channels at speeds of up to 1M-bit/sec.

Attaching directly to IBM host channels — typically used to support disk drives and peripherals that require high-speed links, like page printers — Snaxlink bypasses IBM's 3725 or 3705 frontend processors, Tandem's usual interfaces to IBM mainframes.

Snaxlink consists of a communications interface that attaches to a Tandem system's I/O channel, a channel attachment unit that connects to an IBM system' channel, and a fibre-optic link between the units. The Tandem and IBM systems can be up to 500 metres apart.

Snax, which communicates with IBM's Virtual Telecommunications Access Method, has been upgraded to support Snaxlink. Applications that use Snax now do not have to be modified to use Snaxlink, the company said.

Snaxlink allows for full-duplex communications and can handle up to 1020 sessions concurrently. The fibre-based link can be attached to both block and byte-multiplexed IBM host channels.

Snaxlink costs $US49,550 for a single unit and $US79,676 for two units. Basic monthly maintenance charge is $US88 for one unit and $US176 for two units. The monthly licence fee for software is $US125 a unit.

Snaxlink will be available in the US late this year. Australian availability and pricing have not been announced yet.

## SHOW CASE

### SNAPSHOTS FROM THE EXHIBITIONS

**NEW YORK — Less than six months after introduction of the IBM PS/2, communications cards from several non-IBM sources made their debut at the recent PC Expo here.**

**DCA's Irma 2 for the Micro Channel bus lets PS/2s communicate with mainframes by emulating an IBM 3270-type terminal. Irma 2 consists of Ram-based hardware, new E78 Plus terminal emulation software, and Irmalink FT/TSO and FT/CMS file transfer software for both the TSO and CMS mainframe environments.**

**DCA also showed a Micro Channel version of Smart Alec, which links PS/2s to IBM System/34, System/36, and System/38 computers by emulating 5250/90 terminals.**

**CXI, a division of Novell, announced the PCox/Coax-P board which lets individual PS/2 Model 50, 60, and 80 computers communicate with mainframes. It is said also to act as a gateway, offering similar capabilities to PC on a Netware Lan.**

**MUNICH — West German vendors Computer AG and Siemens AG are jumping on to the 80386 micro market: both are tipped to launch their entries at the Systems '87 computer trade show here this month.**

**The two new products, which will have integrated motherboards, are to run under version 3.2 of MS-Dos. According to Nixdorf insiders, the XT will be replaced by an 16MHz 80386-based AT-compatible.**

**Siemens plans to present a new PCD-2L AT-compatible that is designed to work in a local networking environment. on one file server and improve overall network performance.**

**NEW YORK — Seeking to boost workstation support and improve performance, Novell announced the 16MHz Novell 386A — first in a line of 386-based file servers, at PC Expo. The eight-slot standard system includes a 40M-byte hard disk drive, 1M-byte of Ram expandable to 4M-bytes, and one 1.2M-byte floppy disk drive, for around $US6000 according to one source.**

**Sources said Netware 386 will not be immediately available for the 80386-based file servers, because Novell has been concentrating on the released version 2.1 of its networking software.**

# Cost-cutting flexibility claimed for Vista Gate

*By Maggie Macrae*

ROME — As part of its plan to become the industry's leading systems integration and networking company, Datapoint released the Vista Gate network communications server at Arcnet '87.

According to Larry Wickwar, vice-president of development for Datapoint, Vista Gate means cost-cutting in equipment expense, concurrent support of multi-communications protocols over a single host communications link, the sharing of communications hardware and software over the network, and maximum connection flexibility through the support of switched and leased lines, and X.25 data networks.

"The function-independent user interface makes access to this division of communications capabilities transparent to the user and available at a single key stroke," Wickwar said. "Vista Gate is therefore essentially an ARC (attached resource computer)-based communications server platform."

The Vista Gate server makes a range of new connection capabilities available as network resources on the Arcnet system. It supports IBM 3270 emulation, IBM Disoss/370 connections, IBM 3777 remote job entry, ISO/OSI protocols and LU 6.2 and is based on the standard IBM PC AT bus.

Vista Gate supports Honeywell Bull, Unisys, DEC, Wang, Data General Tandem, IBM, and most teletype, teletex or videotex terminals and most international communication services and switching networks, including Austpac and OTC X.25 networks. A typical system with 16-user SNA/X.25, 3270 and 3777 hardware and software, including intelligent communications adapter, high-speed Ram, cabling and basic server software, costs $US6245. Local availability was not immediately announced.

**Larry Wickwar, vice-president, product development, Datapoint Corporation.**

# AT&T re-enters micro, mini fray

PARSIPPANY, New Jersey — US phone company AT&T has re-stated its commitment to the computer market, introducing a micro and a highend minicomputer laden with network potential as well as a barrage of enhancements to existing communications products.

AT&T announced the 3B4000 minicomputer and 6386 Workgroup System microcomputer and enhancements to its Starlan, the Information System Networks (ISN) and the AT Mail electronic messaging service. Local AT&T distributor Olivetti has not yet announced availability and pricing for the new products.

The 3B4000 is a departmental computer capable of processing up to 43.4Mips and supporting up to 300 users when fully configured. Positioned at the high end of the 3B product line, the machine features a modular, multiprocessor architecture and has a list price beginning at $US187,000.

Networking interfaces provided for the 3B4000 include an X.25 interface, an LU 6.2 facility, a TCP/IP interface and emulation of IBM 3270 terminals and 3770 remote job entry (RJE) workstations.

The X.25 interface software lets the 3B4000 connect to packet-switched networks such as Austpac or to link directly to other computers through dial-up or dedicated telecommunications circuits.

The LU 6.2 facility is a software development tool for putting IBM's peer-to-peer protocol to work in 3B4000 environments. It allows the 3B4000 to communicate with other LU 6.2 programs on other 3B computers or non-AT&T computers within a SNA environment.

The TCP/IP interface software supports Unix System V features and provides a means for clustering AT&T computers and communicating with other manufacturers' equipment, AT&T said.

In addition, Binary Synchronous Communications/RJE emulation software provides support for IBM's BSC protocol. .

In addition, the mini can run an e-mail package that translates documents and mail messages into formats required by other systems, such as IBM's Disoss and Professional Office System, Wang's OIS and VS, and DEC's All-in-One.

AT&T also unveiled the 32-bit 6386 Workgroup System, a microcomputer available in desktop and floor-standing models, which support 20 or 32 simultaneous users. It is said to "support Unix System V applications concurrently with up to eight MS-Dos applications".

Both versions are compatible with Starlan, IBM's PC Network and Token-Ring Network, and Novell's Netware network operating system.

Version 2.0 of Starlan, also released, provides an improved interface to IBM's Netbios, automatic parameter setting at installation for optimising server operation, improved menus and a new server command-line parameter to support connections such as the System 25 Remote PC Service.

Enhancements to AT&T Mail include a set of software products called Private Message Exchange (PMX).

AT&T will introduce an X.400 standard message handling interface for the mail service at Telecom '87 in Geneva later this month.

# Hewlett-Packard pips DEC at post

MELBOURNE — Hewlett-Packard has become the first large-system vendor to announce a 10M-bit/sec Ethernet local-area network that will connect its hosts and workstations across ordinary unshielded twisted-pair wiring.

The HP Starlan 10 will allow users to support high-speed applications and workstations — particularly the new wave of 80386-based personal computers — without the need to instal new building wiring, according to HP's Information Networks Division.

Hewlett-Packard Australia said the system is due here in the first half of next year and will be sold through HP direct sales channels for under $A2000.

Companies can use their buildings' existing unshielded twisted-pair wiring in 8 per cent of cases, HP said.

Starlan 10 is said to support distances of up to 100m between wiring closets and workstations, which according to a recent AT&T study is where 80 per cent of user workstations are located.

The HP Starlan 10 hardware includes a 12-port hub that will support IBM and HP personal computers at a cost of less than $A2000 per user, plus $A200 to $A300 for PC servers. Up to 12 hubs can be daisy-chained together at one wiring closet.

The Starlan 10 is compatible with and can communicate with HP's existing 1M-bit/sec Starlan network. This lets users mix and match 1M-bit/sec and 10M bit/sec network hubs on the same twisted-pair system.

A bridge lets users of the HP Starlan 10 access HP 3000 hosts residing on a coaxial Ethernet. HP is expected to announce an HP 3000 version of Starlan 10 later.

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**1. What is your primary job function? (Please circle one only)**
01 Director/Partner/General Manager
02 Co Secretary/Financial Controller/Accountant
03 Director/Manager of Office Admin
04 Director/Manager of MIS
05 Director/Manager of DP/ADP
06 Projects Manager
07 Systems Software Management/Development
08 Manager/supervisor operations
09 Systems analyst
10 Analyst/Programmers
11 Programmers
12 Operations Staff
13 Database administrators
14 Communications Manager
15 PC/Micro Managers
16 PC/Micro specialists
17 Computer Consultants
18 Communications Consultant
19 Computer Contractors
20 Consultants (other that Computer consultants)
21 Technical/Scientific/R&D
22 Computer Sales/Marketing
23 Sales/Marketing (other)
24 Librarian/Educator
25 Lawyer/Medicine
26 Student
27 Other

**2. What is the primary business activity of your company/organisation? (Circle one only)**
01 Manufacturer — Computer/DP Hardware/Peripherals
02 Manufacturer — all other excl. computers and electronics
03 DP Service bureau/software/planning/consulting
04 Public Utilities/Communications Systems/Transportation
05 Wholesale/Retail
06 Finance/Insurance/Banking
07 Mining/Construction/Oil and Refining
08 Business services (not DP)/Real Estate
09 Education/Medicine/Low
10 Government-Federal/State/Local
11 Printing/Publishing/other communication services
12 PR and Advertising
13 Communications consulting services
14 Manufacturer-communications systems equipment
15 Other

**3. In your company, please indicate your primary functional involvement with communications.**

| | Data | Voice | Image |
|---|---|---|---|
| Planning/ Development | | | |
| Operations | | | |
| Management | | | |

**4. Which best describes your organisation's involvement with communications? (Please circle one only.)**
A. Commercial or institutional enduser of communication systems and equipment (including all industries and businesses).
B. Government — Federal/State/local (including military).
C. Interconnect (including manufacturer, contractor, wholesaler or other vendor)
D. Communication service (including common carriers, telephone companies utilities and broadcasting)
E. Systems integrators, systems and software houses, service bureaus and consultants.
F. Other (please specify).

**5. What size is your organisation by employee numbers (circle one).**
01 Very small (less than 50 employees)
02 Small (50-250)
03 Small/medium (250-500)
04 Medium (500-1000)
05 Medium/large (1000-5000)
06 Large (5000-10,000)
07 Very large (10,000 plus)

**6. In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services? Circle ALL that apply.**
1. Recommend/specify
2. Identify/evaluate potential vendors
3. Approve the acquisition
4. None of the above

**7. Check ALL that apply in columns A and B.**
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B These products and services are presently in use at this location:

A B *Product/Services*
*Computers*
01 ☐ ☐ Personal computers
02 ☐ ☐ Minis
03 ☐ ☐ Mainframes
*Data Communications*
04 ☐ ☐ Communications processors
05 ☐ ☐ Comm /networks software
06 ☐ ☐ Digital switching equipment
07 ☐ ☐ Facsimile
08 ☐ ☐ Modems
09 ☐ ☐ Multiplexers
10 ☐ ☐ Protocol converters
11 ☐ ☐ Network mgmt & control
12 ☐ ☐ Test equipment
13 ☐ ☐ 3270 controllers
*Telecommunications*
14. ☐ ☐ PABX
15. ☐ ☐ Commander/key systems
16. ☐ ☐ Integrated voice/data terminals

A B *Product/Services*
*Transmission/Network Services Equipment*
17. ☐ ☐ Microwave
18. ☐ ☐ Satellite earth stations
19. ☐ ☐ Local area networks
20. ☐ ☐ Wide area networks
21. ☐ ☐ Packet switching equipment
22. ☐ ☐ Fibre optic equipment
*Communications Services*
23. ☐ ☐ Packet switching services
24. ☐ ☐ Cellular mobile radio services
25. ☐ ☐ Electronic mail
26. ☐ ☐ Enhanced services
27. ☐ ☐ Paging systems

**8. How much (estimate) does your company spend annually on communications?**

| $ | 0-50,000 | 50-250,000 | 250-500,000 | 500-1 mil | 1-5 million | 5 million+ |
|---|---|---|---|---|---|---|
| capital | | | | | | |
| ongoing | | | | | | |

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# Wood acts as midwife in SNA tool's birth

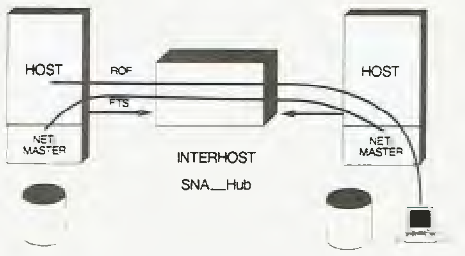
SYDNEY — True to his belief that "PCs are at the cutting edge of SNA" today, Netlink CEO Paul Wood acted as midwife here recently at the announcement of Net/Master-PC, a micro version of the Vtam network enhancement system from Software Developments.

At the same time, marking a strategic alliance with Software Developments, Wood officiated at the joint launch with SD of Netlink's Interhost SNAHub with Net/Master Version 2 support for linking non-compatible hosts.

SD managing director John Robinson explained that organisations with different release levels of the traditional IBM links MSFN (multi-system networking facility) or the new SNI (SNA network interconnection), in their SNA or Fujitsu lookalike FNA systems could previously not communicate across non-homogenous networks.

In addition, there were organisational and technical constraints which restricted the use of casual dialup connections. Such constraints limited organisations' opportunities for taking advantage of new technologies such as EDI (electronic data interchange), said Robinson.

**NET/MASTER INMC SUPPORT**



He saw an enormous potential market for the product in the US and Europe, particularly among the 1500 current Net/Master users.

The Interhost SNAHub from Netlink can establish links between otherwise unconnected SNA networks using SD's specially developed support software called Inter-Net/Master Connection (INMC). This program provides either single-link or optionally multilink connection for up to eight concurrent SNA sessions in each direction.

"Inter-SNAHub provides a single bridge across the chasm between business need and business opportunity," said Robinson. Wood commented that "organisations need to communicate and work properly together without first having to get married".

"US insurance, in particular, needed the casual connectivity made possible by Interhost SNA-Hub for their business relationships with major customers," Wood said. This was one kind of what he termed the "evolving strategic relationships". The product is to be released in the US next month

According to Robinson, both the Australian Health Commission and the Commonwealth Bank are trialling the new system. He would not comment on speculation that the two organisations were already laying the groundwork for interconnection to service the controversial Australia Card national identity database system.

Robinson said his company's new product Net/Master-PC was a "logical progression into the PC environment". It would be released in stages. The first module, FTS offered "commercial file transfer at commercial volumes and speeds", he said.

"Taking advantage of the SNA architecture and including our own multi-tasking drivers, it established a logical link between a host running Net/Master and a PC, consisting of a full-duplex SNA session. FTS was thus capable of sending an receiving files concurrently.

In addition, it host-synchronised security via ACF2, RACF. SD had worked with the banks to meet this requirement, said Robinson.

THE NEW BREED OF MODEMS

Highspeed modems today are a new breed, becoming more and more similar to powerful communications processors. Only a short while ago "high-speed" meant a maximum of 2400-bits/sec for dialup modems, and perhaps 9.6k-bit/sec for four-wire leased line units.

Today, users can buy dialup, error-correcting modems with data rates of 14.4k-bit/sec or even up to 18.8k-bit/sec if they are concerned with speed more than with standards that are always trying to catch up with technology. According to a Yankee Group survey, there is user (and vendor) dissatisfaction abroad with the performance of dialup 9.6k-bit/sec modems conforming to CCITT recommendation V.32. Modem makers have begun pushing the speed barrier forward, using compression algorithms or new modulation techniques.

**The Core Report of *Communications World* in November** will concentrate on the new breed of dialup business modems. **In addition, there will be a "sideshow" on the videotex scene.**

Editorial contributions to both topics are welcome. Please discuss the requirements with the editor, **Luis Huesch, on (02) 439 5133** or **(02) 960 3710. Editorial deadline is October 15.**

For advertising enquiries contact **Terry Swan** on **(02) 439 5133** or **Winkie Corfield** on **(09) 384 5856. Booking deadline: October 9th. Material deadline: October 16th.**

COMMUNICATIONS WORLD

## *Two-tier system can service 8 concurrent users*

NEW YORK — Novell has announced a new two-tier entry-level local area network operating system at the recent PC Expo here. Entry Level Solution (ELS) Netware 28 Level I, V2.0 A is available now for $US595, with ELS Netware Level II, V2.1 due in the first quarter of next year.

Novell will also jointly market Excelan's TCP/IP workstation for Netware. ELS Netware V2.0A is said to provide simplified installation and maintenance for networks using as many as four simultaneous workstation connections. It operates in non-dedicated mode, with the file server also operating as a network workstation.

The operating system can use an IBM PC AT or AT-compatible or PS/2 Model 50 or 60 as the network file server. The operating system can use Ethernet or Arcnet adapters, or the IBM PC Network Card for IBM's new Micro Channel bus.

ELS Netware Level II ($US1395) can service as many as eight concurrent users, running in non-dedicated mode in file servers compatible with Netware. It provides compatibility for more than 48 Lan adapters, and includes one remote internetwork connection.

Level II will provide an extra streamlined network alternative for departmental and workgroup Lans, the company said. Both ELS Levels I and II, which do not require key cards, will support Dos 3.X and greater.

Excelan's TCP/IP workstation for Netware — a $US995 hardware and software combination — is an alternative to the use of a communications gateway and allows a personal computer workstation on a Lan to gain direct access to and transfer files concurrently with a Netware server and TCP/IP host computer.

# Dow Jones to quadruple net capacity

*By Josh Gonze*

**EXECUTIVE SUMMARY SCREEN**

US financial publisher Dow Jones is quadrupling the capacity of a corporate satellite network that is bursting at the seams — for a tenth of what it would have cost to replace the network. Key to the communications manager's apparent sleight-of-hand solution is an innovative mix of technologies called "frequency hopping".

By using a combination of time division (TDMA) and frequency division (FDMA) satellite access techniques, each terminal at 17 printing plants around the country gets two to four times the throughput of faxed newspaper pages than under the existing TDMA scheme.

The savings, compared with having to instal an entire new set of terminals, are a whopping $US7.3 million.

SOUTH BRUNSWICK, New Jersey — With its satellite network operating at full capacity and data traffic threatening to bank up, Dow Jones & Co is implementing an innovative technique that should quadruple the capacity of its existing net.

The company will spend $US680,000 to upgrade the network for new technology, which combines time-division and frequency-division satellite access techniques staving off the need to replace the network, at an estimated cost of $US8 million.

Dow Jones, publisher of *The Wall Street Journal* and other publications, uses the satellite network to beam facsimiles of newspaper pages from three regional composition sites to earth stations at 17 printing plants around the US, as well as to carry voice and data traffic.

The original network employed time-division multiple access (TDMA), an access technique that allows earth stations to share the same frequency bandwidth. Under TDMA, each transmission burst is precisely timed to arrive in sequence, so that only one earth station is accessing the transponder at any given time.

Until the beginning of August, all 17 stations on the seven-year-old network operated at one frequency and shared the same 11MHz of bandwidth.

The Dow Jones's Comtel TDMA terminals provide each earth station with up to 15M-bit/sec of throughput. But since under the TDMA system each station had to wait its turn to transmit, the 15M-bit/sec maximum was never realised by the individual stations.

The new access capability combines TDMA with frequency-division multiple access (FDMA), creating what Comtel calls "frequency hopping". The FDMA equipment being added to the earth stations will let them transmit on each of several frequencies.

The potential transmission time for each earth station will be increased in exact proportion to the number of frequencies available. Six of the 17 stations will transmit on four frequencies, giving them four times as many timeslots on which to transmit, while the other 11 will each support two frequencies and enjoy twice as much transmission time.

Bill Collins, manager of satellite operations at Dow Jones, said the ability to allocate time slots on four frequencies will be a low-cost boon to network capacity. "What the frequency hopping allows us to do is, depending on how many hops we make, use up to four virtual TDMAs without increasing the (TDMA) hardware," he said.

The frequency-hopping capability will push the maximum throughput of the two-way communications network from 15M-bit/sec to 60M-bit/sec and cost about $US40,000 per earth station. If Dow Jones had not been able to develop and implement the frequency-hopping capability, it would have had to scrap the 15M-bit/sec TDMA equipment installed at all 17 stations and replace it with Comtel's 60M-bit/sec terminals.

That would have cost roughly $US 200,000 per earth station, a price that does not include the electronic gear that performs frequency conversion and amplification. The total cost of an all-TDMA network providing 60M-bit/sec of throughput would have been $US400,000 to $US 500,000 an earth station, or roughly $US8 million, said David Block, manager of engineering services at Comtel.

Dow Jones may be the first commercial user to combine frequency- and time-division access on the same net, Block said.

# PC system to help the non-experts

MELBOURNE, Florida — Harris Corp has developed a personal computer-based expert system that helps nontechnical staffers troubleshoot the company's SNA network. Harris, a manufacturer of communications, data processing and electronics equipment, designed its Network Problem Determination Expert System (NPDes) to simplify network management. The system has helped reduce network and operation staff from 62 to 36 in two years.

NPDes can pinpoint problems in software and operational mistakes made by endusers, and it can get status information about specific devices in the network by interacting with Vtam on one of the company's two IBM host computers.

"This system goes through the network and checks the status of users' terminal and control units, all paths and all applications," said Charlie Snell, director of communications and computing at Harris.

NPDes runs an IBM PC AT compatible outfitted with an Irma board that enables the microcomputer to communicate with the mainframe as a terminal.

The program is based on an expert system shell called Insight 2+ from Level Five Research. The Insight 2+ package provides the inference engine for the expert system, helping pinpoint network problems by following rules input by Harris technicians.

The rules were written in consultation with networking experts. "We sat down with our network experts and asked them to tell us what they would do when given a certain piece of information, what additional information they would ask for. We went through the whole problem solving phase," Snell said. "After picking their brains, we wrote their responses into the rules."

The system currently has 200 rules and helps solve about 90 per cent of the queries it receives by recommending action to the operator. It identifies hardware failures, however, without recommending action. A future version of NPDes will be able to issue its own commands to Vtam to correct the problem without intervention from an operator.

Snell estimated that NPDes should begin to make modifications in the network within three months. NPDes frees experienced technicians from the day-to-day grind of solving low-level problems on the 6000-terminal network.

# Security boost here for Lans

WESTBORO, Mass — Banyan Systems has demonstrated Vanguard, an extension of its virtual network software (Vines) operating system said to bring mainframe-like security to local-area networks. Vanguard is part of Vines Release 3.0, due to be released in November. Support for IBM's LU6.2 is a key feature.

Vanguard offers features similar to those found in mainframe security packages like IBM's RACF and Uccel's ACF2 as well as Computer Associates's CA-Top Secret, Banyan said.

Features include audit trails and reporting tools, password encryption, protection from unauthorised logon or access to network traffic and other capabilities that significantly increase an administrator's ability to control access to networks running Vines, according to the company.

A wide range of group and individual security features will be offered, including user identification expiration dates, limitations on users' ability to change passwords and physical location, as well as time/date logon restrictions and dialin limitations.

Banyan is highlighting the following two major security benefits:

- The ability for Lan administrators to select the level of protection security options they want.
- The ability to centrally control access to network resources.

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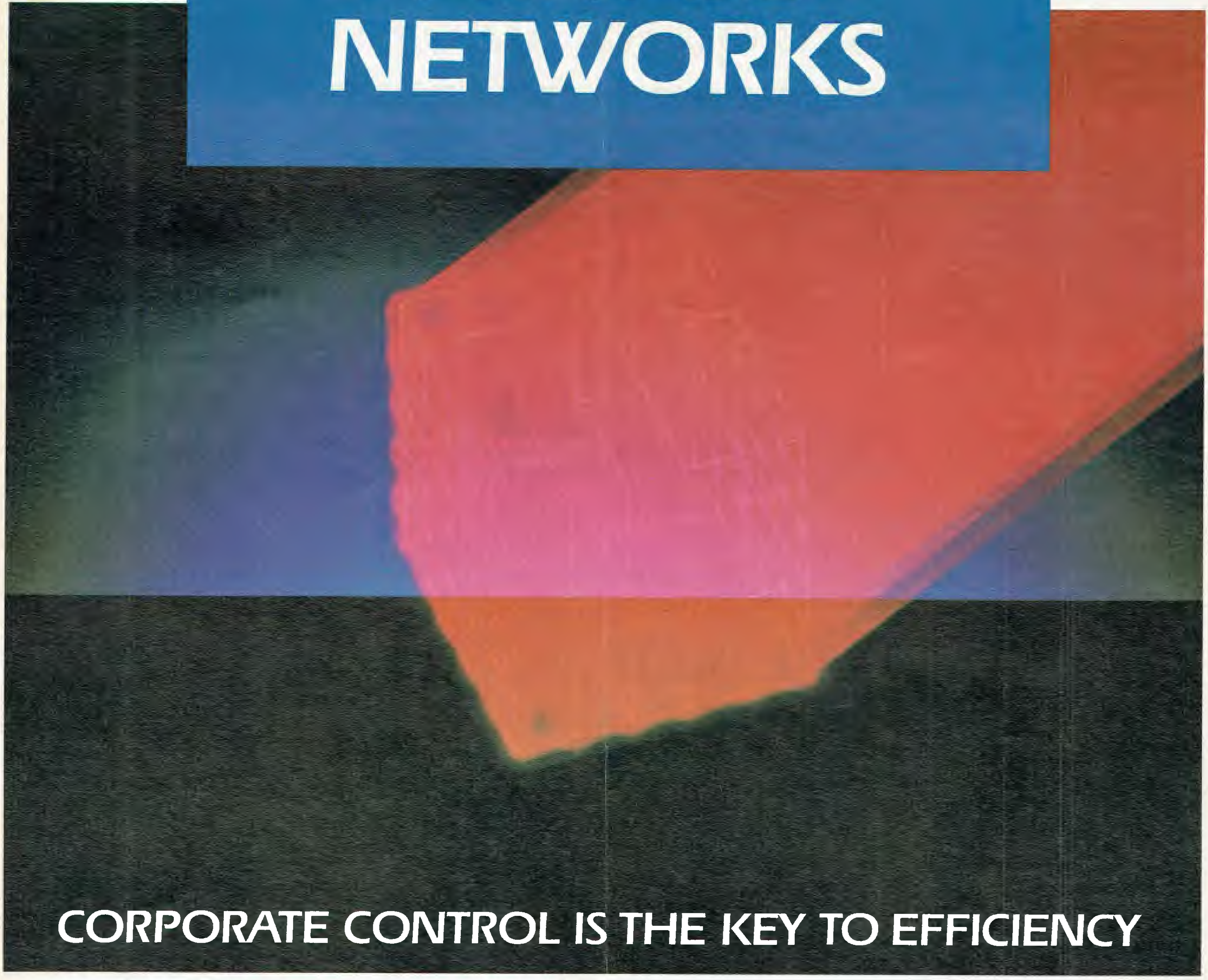
# PRIVATE NETWORKS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